ORIGINAL ARTICLE

An Examination of the Factors Affecting Community Pharmacists' Knowledge, Attitudes, and Impressions About the COVID-19 Pandemic

Serbest Eczacıların COVID-19 Pandemisi Hakkında Bilgi, Tutum ve İzlenimleri ve Etkileyen Değişkenlerin İncelenmesi

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ABSTRACT

Objectives: Coronavirus disease-2019 (COVID-19)-related cases and deaths are ongoing throughout the world, but there is still no effective drug in its treatment, and the vaccine supply is not adequate for the global population. It is important that pharmacists have sufficient knowledge and awareness to prevent and control the disease. COVID-19 has been widely covered in the media, which has been a source widely used by healthcare professionals. This study aimed to assess the knowledge, attitudes, and impressions of community pharmacists about COVID-19 and the factors affecting them.

Materials and Methods: The questions in this survey were formed using the guideline created by the World Health Organization, a guide composed by the Turkish COVID-19 Scholarly Commission, and data disclosed to the public on the website of the Ministry of Health. The questionnaire was designed with Google forms and then applied to community pharmacists all over Turkey by sharing the survey link.

Results: Analyses of 393 questionnaires showed that Ministry of Health/government statements, the internet (scientific sources), and the media were the preferred sources of information (96.7%, 89.6%, and 84%, respectively). "Ways to avoid COVID-19" was the most searched title (96.9%). It was determined that the names of the two drugs most frequently mentioned by the participants to be used in the treatment of COVID-19 in Turkey were hydroxychloroquine and azithromycin (57.5%; 50.1%, respectively). Participants who received information from the media gave less education to patients/customers on personal protection measures against COVID-19 (83.3%) and symptoms of COVID-19 (78.8%); however, their behavior regarding the training of pharmacy personnel was found to be the opposite. It has been determined that about half of the participants (46.6%) mostly trust the Ministry of Health regarding the COVID-19 pandemic.

Conclusion: Media and other sources influence the knowledge, behavior and impressions of pharmacists'. Having a high level of knowledge positively affects people's behavior. It is important for pharmacists to have accurate information about COVID-19 and to transfer their knowledge to the community to provide patient education and to prevent/control the spread of COVID-19.

Key words: COVID-19, pandemic, community pharmacists, knowledge, attitude

ÖZ

Amaç: Koronavirüs hastalığı-2019 (COVID-19) kaynaklı olgular ve ölümler dünya çapında devam etmekte ancak hala etkili bir aşı ve ilaç bulunmamaktadır. Salgın sürecinde önemli rol oynayan eczacıların, yeterli bilgi ve farkındalığa sahip olmaları hastalığın önlenmesi ve kontrolü için önemlidir. COVID-19 medyada geniş yer bulmakla birlikte medya, sağlık uzmanları tarafından yaygın olarak kullanılan bir kaynak olmuştur. Bu çalışma, serbest eczacıların COVID-19 hakkındaki bilgi, tutum ve izlenimlerini ve bunu etkileyen faktörleri değerlendirmeyi amaçlamaktadır.

Gereç ve Yöntemler: Bu anketteki sorular, Dünya Sağlık Örgütü tarafından oluşturulan kılavuz, Türkiye COVID-19 Bilim Kurulu'nun oluşturduğu COVID-19 kılavuzu ve Sağlık Bakanlığı internet sitesinde açıklanan veriler kullanılarak oluşturulmuştur. Anket Google form üzerinde oluşturuldu ve ardından anketin linki paylaşılarak Türkiye'nin dört bir yanındaki serbest eczacılara uygulandı.

Bulgular: Üç yüz doksan üç anketin analizi Sağlık Bakanlığı/hükümet açıklamaları, internet (bilimsel kaynaklar) ve medyanın bilgi almak için en çok tercih edilen kaynak (sırasıyla; %96,7; %89,6 ve %84) olduğunu göstermiştir. Katılımcılar tarafından en çok aranan başlığın "COVID-19'a karşı korunma yolları" olduğu bulunmuştur (%96,9). Türkiye'de COVID-19 tedavisinde kullanım için katılımcılar tarafından en çok yazılan iki ilacın adının hidroksiklorokin ve azitromisin (sırasıyla; %57,5; %50,1) olduğu tespit edilmiştir. Medyadan bilgi alan katılımcıların hastalara/müşterilere COVID-19'a karşı kişisel korunma önlemleri (%83,3) ve COVID-19 semptomları (%78,8) konusunda daha az eğitim verdiği; ancak eczane personelinin yetiştirilmesi konusundaki davranışlarının bunun tam tersi olduğu görülmüştür. COVID-19 salgın süreci ile ilgili olarak katılımcıların yaklaşık yarısının (%46,6) en çok T.C. Sağlık Bakanlığı'na güvendiği tespit edilmiştir.

Sonuç: Medya ve diğer kaynaklar eczacıların bilgi, davranış ve izlenimlerini etkilemektedir. Yüksek düzeyde bilgi sahibi olmak, insanların davranışlarını olumlu yönde etkilemektedir. Eczacıların COVID-19 hakkında doğru bilgiye sahip olmaları ve edindikleri bilgileri topluma aktarmaları ve COVID-19'un yayılmasını önlemek ve kontrol altına almak için hasta eğitimi vermeleri önemlidir.

Anahtar kelimeler: COVID-19, pandemi, serbest eczacılar, bilgi, tutum

INTRODUCTION

In December 2019, the pathogen named as the novel coronavirus caused an outbreak of Coronavirus disease-2019 (COVID-19) in Wuhan, Hubei Province, China.[1] The virus was highly infectious, spreading rapidly via human-to-human transmission.[2] Consequently, COVID-19 spread rapidly from the first epicenter, the city of Wuhan, into neighboring countries and was declared a global pandemic by the World Health Organization (WHO). The pathogen was then renamed novel severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2).[2,3]

Common signs of SARS-CoV-2 infection include respiratory symptoms, fever, cough, shortness of breath, and breathing difficulties. In more severe cases, infection can cause pneumonia, SARS, organ failure, and even death.[1] As of October 20th 2020, SARS-CoV-2 had caused 40,693,256 infections and 1,123,596 deaths worldwide, and there were still no effective vaccine products or drugs to prevent and treat COVID-19 infection.[4] (https://www.worldometers.info/coronavirus/?utm_campaign = homeAdvegas1?#countries).

Pharmacists have always been the initial point of contact for healthcare delivery and have played important roles during pandemics and viral epidemics. These comprise vaccination, drug delivery, health training, and supplying direct patient care in the case of extraordinary circumstances, such as throughout the H1N1 pandemic.[5,6] In addition, it was determined that cases with suspected COVID-19 applied to nearby health centers, such as pharmacies, for medical assistance.[7] For this reason, to prevent and control the disease, it is vital that sufficient knowledge and awareness be created among pharmacists about the pandemic and that the factors directing their perceptions and behaviors be identified.[8]

Since the first day of the outbreak, COVID-19 has been widely covered in the news media, press, and social media.[8] It has been observed that the media assists both healthcare professionals and the general public in acquiring information to improve their knowledge, awareness, and implementation.[9] The media also plays an important part in communication among investigators, scientists, general health experts, and funding organizations for an efficient and swift global response.[9,10] This research aimed to assess the knowledge and attitudes of community pharmacists about COVID-19 and the role of the media and other factors in shaping pharmacists' knowledge, perception, and attitudes during the COVID-19 pandemic.

MATERIALS AND METHODS

This is a cross-sectional study based on a self-report questionnaire. The study was conducted between May 2020 and July 2020 during the quarantine period. As it was not feasible to conduct a population-based survey at that time, a questionnaire was designed on Google forms, and a link was shared using social media applications to invite community pharmacists from all over Turkey to participate in the study. Prior to their participation, pharmacists were given information about the aim and description of the study and informed that their attendance would be anonymous and voluntary, and that their data will be treated as confidential. The mean completion duration of the questionnaire was 13 minutes. Ethical approval to conduct the study was obtained from Acıbadem Mehmet Ali Aydınlar University and Acıbadem Healthcare Institutions Medical Research Ethics Committee (reference number: 2020-15/18). All procedures performed in the study involving human participants followed the ethical standards of the institutional research committee and the 1964 Helsinki Declaration.

The questions in this survey were formed using the guideline [Survey tool and guidance: Behavioral insights on COVID-19 (2020)] created by the WHO, a guide (COVID-19 Guide) composed by the Turkish COVID-19 Scholarly Commission, and the COVID-19 data made public on the Ministry of Health internet site.[11] (https://hsgm.saglik.gov.tr/tr/bulasici-hastaliklar/2019-n-cov.html). The participants' names and surnames were not included in the survey, and the data were collected anonymously. Age, gender, education level, years of experience in the profession, and location and city of their pharmacy were collected as demographic data. The names of the medications that are being used in Turkey for the treatment of COVID-19 were requested to gain an understanding of participants' interest in the treatment of COVID-19 (open-ended, no-option questions). Twenty-nine other multiple-choice questions were about information resources, knowledge, opinions, impressions, and behaviors regarding COVID-19. Participants were instructed to choose a single reply for 9 questions on the questionnaire and multiple replies for the other 14 questions. The questionnaire

also included six true/false questions. For each question, the option "other" was presented as an option, and if this option was selected, an explanation was expected. A total of 26,759 community pharmacists are available in Turkey. (https://dergi. tebeczane.net/public_html/kitaplar/bilgilendirmekitapcigi/ html5/index.html?&locale=TRK&pn = 21). The sample size was calculated as 379 participants with a 95% confidence level and 5% margin of error.

Statistical analysis

Analysis was performed using SPSS version 22.0 (Armonk, NY; IBM Corp.). All data were considered statistically significant at p<0.05 and with a 95% confidence interval. Percentage, mean with standard deviation, median, and minimum-maximum were used for descriptive data. Chi-square tests were used in the analysis of categorical data.

RESULTS

A total of 393 pharmacists participated in this research. The majority of the participants were female (n=262, 66.7%), and their ages varied from 30 to 39 (n=139, 35.3%). In all, 68.7% (n=270) of the pharmacies were outside of Istanbul. Demographic characteristics of the participants are presented in Table 1.

In all, 58.5% (n=230) of participants declared that the origin of the infection is not known definitively, and 66.9% (n=263) of participants stated that the incubation period of COVID-19 is 14 days (Table 2). In all, 62.8% (n=247) of participants expressed that COVID-19 is a vaccine-preventable disease (Table 3), and 38.7% (n=152) of participants specified that a vaccine will be found within 6-12 months and that it will accelerate the end of the pandemic (Table 4).

Nearly all the participants obtained their information from Ministry of Health/government statements (n=380, 96.7%). The internet (scientific sources) was the second most popular source (n=352, 89.6%), and the media was the third most popular source (n=330, 84%) (Table 5). "Ways to be protected against COVID-19" was the most searched title (n=381, 96.9%). In all, 89.3% (n=351) of participants declared that they had made arrangement(s) in their pharmacies to maintain a physical distance of at least 1-2 m between patients. In all, 77.9% (n=306) of participants had given training to pharmacy staff, and 68.4% (n=269) of the participants had given training to patients/ customers about COVID-19 (Table 5).

Participants' knowledge and behaviors toward COVID-19 infection were evaluated in accordance with the first three most preferred sources from which they obtained information

Table 1. Demographic characteristics of the participants		
Parameters		n (%)
Gender	Female	262 (66.7)
	Male	131 (33.3)
Age	20-29 years	82 (20.9)
	30-39 years	139 (35.3)
	40-49 years	90 (22.9)
	50-59 years	71 (18.1)
	≥60 years	11 (2.8)
Education level	License	291 (74)
	Master's degree	86 (21.9)
	PhD	16 (4.1)
Professional experience duration	<5 years	98 (25)
	5-10 years	41 (10.4)
	11-20 years	120 (30.5)
	>20 years	134 (34.1)
Location of the pharmacy	District pharmacy	141 (35.9)
	Opposite the health center	157 (39.9)
	Opposite the hospital	78 (19.8)
	Bazaar pharmacy	17 (4.4)
City where the pharmacy is located	İstanbul	123 (31.3)
	Out of İstanbul	270 (68.7)

about COVID-19 infection and statistically significant results were obtained only for the issues specified below.

When the behaviors of the pharmacists "who received information from Ministry of Health/government declarations" and "those who did not" were compared, statistically significant differences were determined in the following:

- Their faith in the protection from COVID-19 offered by the use of a surgical mask (88.4% and 69.2%, respectively p=0.038);

- Their knowledge about airborne transmission of the infection (84.5% and 61.5%, respectively; p=0.028); their knowledge about transmission of the infection through surface contact (95.8% and 76.9%, respectively; p=0.002);

- Their perception that the health of people over 60 years will be the most adversely affected if they are infected with COVID-19 (93.4% and 76.9%, respectively; p=0.023);

- Their belief that covering the mouth and nose with a disposable tissue would protect against the infection (27.6% and 61.5%, respectively; p=0.008);

Table 2. Knowledge questions about COVID-19 disease

Questions	Answers*	n (%)
What is the original source of the infection?	It is not known clearly	230 (58.5)
	Bats	86 (21.9)
	Humans	34 (8.7)
	Other (artificial-produced in the laboratory)	43 (10.9)
How long is the incubation period of COVID-19?	2-4 days	104 (26.5)
	14 days	263 (66.9)
	15-28 days	26 (6.6)
What is the mortality rate from COVID-19?	0-1%	25 (6.4)
	1.1-5%	278 (70.7)
	5.1-10%	78 (19.8)
	10.1-25%	5 (1.3)
	>25%	7 (1.8)
In your opinion, which of the following is the most correct approach about using masks?	Only those who are sick should wear a mask	17 (4.3)
	Everyone in society should wear a mask	372 (94.7)
	Only healthcare professionals should wear a mask	1 (0.3)
	Only people in the risk group (over 60 years, pregnant, etc.) should wear a mask	3 (0.8)
At least how many seconds should hands be washed with soap and water?	20 seconds	244 (62.1)
	30 seconds	90 (22.9)
	45 seconds	30 (7.6)
	1 minute	29 (7.4)

*Only one option was chosen. COVID-19: Coronavirus disease-2019

Table 3. The approach of the participants to true-false knowledge questions about the COVID-19

Proposal	True, n (%)	False, n (%)
Alcohol-based hand sanitizer compensates for washing hands with soap and water	154 (39.2)	239 (60.8)
Soap used to protect against COVID-19 must contain antiseptic	35 (8.9)	358 (91.1)
There is a possibility of transmission of SARS-CoV-2 infection from products from China	204 (51.9)	189 (48.1)
COVID-19 is a vaccine-preventable disease	247 (62.8)	146 (37.2)
Once the person with the COVID-19 infection recovers, they are immune and will not be able to become infected with COVID-19 again	82 (20.9)	311 (79.1)
Even if COVID-19 is treated successfully, it leaves sequelae in patients	270 (68.7)	123 (31.3)

COVID-19: Coronavirus disease-2019, SARS-CoV-2: Severe acute respiratory syndrome-coronavirus 2

Table 4. The participants' impressions on the COVID-19 pandemic process		
Questions	**Answers***	**n (%)**
When do you think the pandemic will end?	When the air temperature rises	4 (1.0)
	Within 1-2 months	4 (1.0)
	Within 6-12 months	90 (22.9)
	Within 1-2 years	178 (45.3)
	Within 2-5 years	82 (20.9)
	Within 5-10 years	4 (1.0)
	After 10 years	1 (0.3)
	It will not end	30 (7.6)
Which of the following best describes your thoughts about the COVID-19 vaccine?	I think the vaccine will be found within 6 months, and it will accelerate the end of the pandemic	38 (9.7)
	I think the vaccine will be found within 6 months, but it will not affect the course of the pandemic	18 (4.6)
	I think the vaccine will be found within 6-12 months and it will accelerate the end of the pandemic	152 (38.7)
	I think the vaccine will be found within 6-12 months, but it will not affect the course of the pandemic	40 (10.2)
	I think the vaccine will not be found within 12 months	140 (35.6)
	Vaccine found but not given	5 (1.3)
Which of the following institutions do you trust the most regarding the COVID-19 pandemic process?	T.C. Ministry of Health	183 (46.6)
	World Health Organization	112 (28.5)
	U.S. Food & Drug Administration	27 (6.9)
	Turkish Pharmacists' Association	8 (2)
	International Pharmaceutical Federation	63 (16)
How much do you trust to the source(s) from which you learn about COVID-19?	<10%	27 (6.9)
	10-50%	92 (23.4)
	50%	106 (27)
	50-75%	115 (29.3)
	75-99%	53 (13.5)

*Only one option was chosen. COVID-19: Coronavirus disease-2019

- Their use of behavioral practices to protect themselves against COVID-19 by pouring disinfectant and/or cologne on their hands frequently (94.2% and 76.9%, respectively; p=0.012); washing/wiping everything bought from the outside before bringing it into the home (68.2% and 38.5%, respectively; p=0.025); and not going places such as the market unless absolutely necessary (95% and 76.9%, respectively; p=0.005);

- Their use of behavioral practices to protect against the infection and prevent its spread by putting a plastic shield in front of the existing distribution area in the pharmacy (65.8% and 38.5%, respectively; p=0.042).

When the behaviors of the pharmacists "who used the internet (scientific sources) as an information resource" and "those who did not" were compared, statistically significant differences were determined in the following:

- Their behavioral practice of researching information regarding patient education concerning COVID-19 (79% and 53.7%, respectively p=0.000);

- Their behavioral practice of using a mask while traveling (87.5% and 73.2%, respectively; p=0.012); in crowded environments (100% and 85.4%, respectively p=0.000); while working (95.5% and 68.3%, respectively p=0.000); while wandering the street (90.6% and 56.1%, respectively p=0.000); on public transport (99.1% and 85.4%, respectively p=0.000); whenever leaving home (75% and 41.5%, respectively p=0.000); and all the time (49.7% and 41.5%, respectively p=0.000);

- Their knowledge about transmission of the infection through shaking hands (94.6% and 85.4%, respectively; p=0.002); through sexual intercourse (52% and 34.1%, respectively; p=0.031); and from mother to baby during childbirth (58.2% and 36.6%, respectively; p=0.008);

Table 5. Knowledge and attitude questions about COVID-19 disease

Questions	Answers*	n (%)
From which sources do you get information about COVID-19?	Media (TV, newspaper, magazine)	330 (84)
	Internet (non-scientific sources)	165 (42)
	Internet (scientific sources)	352 (89.6)
	Social media	283 (72)
	Training sessions/scientific meetings	255 (64.9)
	Friends/family	230 (58.5)
	Ministry of Health/government statements	380 (96.7)
Which topics are you researching regarding COVID-19?	Symptoms of COVID-19	368 (93.6)
	Scientific progresses regarding COVID-19 vaccine	266 (67.7)
	Scientific progresses regarding COVID-19 treatment	353 (89.8)
	Patient education	300 (76.3)
	Ways to be protected against COVID-19	381 (96.9)
In which(s) of the following situations do you use a mask for COVID-19?	I use a mask while traveling	338 (86)
	I use a mask when in crowded environments	387 (98.5)
	I use a mask while at work	364 (92.6)
	I use a mask while wandering the street	342 (87)
	I use a mask in public transport	384 (97.7)
	I use a mask every time I leave home	281 (71.5)
	I use a mask all the time	192 (48.9)
Which(s) of the following do you use to protect yourself from COVID-19 during working hours in the pharmacy?	Fabric mask	43 (10.9)
	Surgical mask	345 (87.8)
	N95 mask	125 (31.8)
	Face shield	168 (42.7)
	Glasses	143 (36.4)
	Glove	154 (39.2)
In which way(s) is COVID-19 transmitted?	It is transmitted by airborne	329 (83.7)
	Kissing	393 (100)
	Shaking hands	368 (93.6)
	Surface contact	374 (95.2)
	It is transmitted by blood	195 (49.6)
	During sexual intercourse	197 (50.1)
	From mother to baby during childbirth	220 (56)
What are the symptom(s) of COVID-19?	Fever	393 (100)
	Cough	392 (99.7)
	Dyspnea	390 (99.2)
	Pneumonia	324 (82.4)
	Runny nose	122 (31)
	Kidney failure	68 (17.3)
	Diarrhea	326 (83)
	Bleeding	45 (11.5)
	Sudden loss of consciousness	108 (27.5)
	Asymptomatic	296 (75.3)
	Headache	328 (83.5)

Table 5.continued

Questions	Answers*	n (%)
In case of infection with COVID-19, which person(s)' health will be affected most negatively?	People over 60 years	365 (92.9)
	People with serious chronic diseases such as hypertension, diabetes	380 (96.7)
	Children	67 (17)
	Pregnant women	219 (55.7)
	Young adults	33 (8.4)
	Health workers	198 (50.4)
	Other	4 (1)
Which should be applied to protect from COVID-19?	Washing hands with soap and water	393 (100)
	Avoiding contact with sick people	390 (99.2)
	Using hand sanitizer	375 (95.4)
	Using a N95 mask	96 (24.4)
	Using a surgical mask	380 (96.7)
	Wearing protective clothing	104 (26.5)
	Wearing protective glasses	177 (45)
	Covering the mouth and nose with a disposable tissue	113 (28.8)
	Using medical gloves	114 (29)
What behaviors do you implement to protect against COVID-19?	I wash my hands more often than ever	376 (95.7)
	I frequently pour disinfectant and/or cologne on my hands	368 (93.6)
	I try to touch less frequently surfaces where other people touch	389 (99)
	I take a bath everyday	267 (67.9)
	I wash/wipe everything I bought from the outside before putting it to home	264 (67.2)
	I try to stay away from people who are coughing/sneezing	390 (99.2)
	Except for compulsory situations, I do not go places such as the market	371 (94.4)
	I reduce my use of public transport	378 (96.2)
	I use vitamin supplements	320 (81.4)
Which can prevent COVID-19?	Rinsing the nose with saline	125 (31.8)
	Using vinegar	98 (24.9)
	Consuming ginger	111 (28.2)
	Consuming turmeric	117 (298)
	Consuming echinacea	145 (36.9)
	Consuming vitamin C	345 (87.8)
	Consuming vitamin D	330 (84)
To protect against COVID-19 and prevent its spread, which(s) of the precautions do you apply in your pharmacy?	I change the apron I wear in the pharmacy every day	176 (44.8)
	I placed a plastic shield in front of the existing distribution area in the pharmacy	255 (64.9)
	I made arrangement(s) to keep a distance of at least 1-2 meters between patients	351 (89.3)
	We disinfect the drugs coming from the drug storage before placing them on the shelves	98 (24.9)
	After each patient/customer, we wipe and disinfect the pharmacy counter	223 (56.7)
	After serving each patient/customer, we disinfect our hands with an alcohol-based solution	337 (85.8)

Table 5.continued

Questions	Answers*	n (%)
Have you given training to your pharmacy staff about the COVID-19?	I did not give training	87 (22.1)
	I gave training on personal protection precautions against COVID-19	351 (89.3)
	I gave training on the correct use of masks	320 (81.4)
	I gave training on COVID-19 transmission routes	332 (84.5)
	I gave training about the symptoms of COVID-19 infection	329 (83.7)
Have you given training to your patients/customers about the COVID-19?	I did not give training	124 (31.6)
	I gave training on personal protection precautions against COVID-19	334 (85)
	I gave training on the correct use of masks	326 (83)
	I gave training on COVID-19 transmission routes	315 (80.2)
	I gave training about the symptoms of COVID-19 infection	318 (80.9)

*More than one option was chosen. COVID-19: Coronavirus disease-2019

- Their knowledge about symptoms of the infection is as follows: pneumonia (87.3% and 70%, respectively; p=0.00);

- Their knowledge about people whose health will be most adversely affected if infected with COVID-19 is as follows: Young adults (9.4% and 0%, respectively; p=0.041);

- Their belief in protecting against COVID-19 by using hand sanitizer (96.6% and 85.4%, respectively; p=0.001);

- Their behaviors protecting against COVID-19 by pouring disinfectant and/or cologne on their hands frequently (95.5% and 78%, respectively; p=0.000); trying to touch less often where others touch (99.4% and 95.1%, respectively; p=0.009); having a bath everyday (70.2% and 48.8%, respectively; p=0.005);

- Their knowledge on interception of the infection with using vinegar (22.7% and 43.9%, respectively; p=0.003); consuming ginger (25.9% and 48.8%, respectively; p=0.000); consuming echinacea (33.5% and 65.9%, respectively; p=0.000);

- Their behavioral practices to protect themselves from the infection and prevent its spread by disinfecting their hands with an alcohol-based solution after serving each patient/customer (87.2% and 73.2%, respectively; p=0.015);

- Their behavioral practices in training pharmacy staff regarding personal protection precautions against COVID-19 (91.5% and 70.7%, respectively; p=0.000); regarding correct use of masks (84.1% and 58.5%, respectively; p=0.000); and regarding COVID-19 transmission routes (86.6% and 65.9%, respectively; p=0.001);

- Their behavioral practices in training patients/customers regarding the correct use of masks (84.9% and 65.9%, respectively; p=0.002); regarding symptoms of COVID-19 infection (82.4% and 68.3%, respectively; p=0.030).

When the behaviors of the pharmacists "who received information through the media" and "those who did not" were compared, statistically significant differences were detected in the following:

- Their attitudes in researching information regarding patient education concerning COVID-19 (73% and 93.7%, respectively p=0.000);

- Their behavior in using a mask while working (93.9% and 85.7%, respectively p=0.022);

- Their faith in protection from COVID-19 by fabric mask use (12.7% and 1.6%, respectively p=0.009) and by surgery mask use (89.4% and 79.4%, respectively p=0.026);

- Their knowledge on transmission of the infection via surface contact (96.4% and 88.9%, respectively; p=0.011); through sexual intercourse (46.4% and 69.8%, respectively; p=0.001);

- Their knowledge on the symptoms of COVID-19 is as follows: bleeding (8.8% and 25.4%, respectively; p=0.014); headache (81.5% and 93.7%, respectively; p=0.018);

- Their knowledge about people whose health will be most adversely affected if they are infected with COVID-19 is as follows: People over 60 years (94.2% and 85.7%, respectively; p=0.016); young adults (6.4% and 19%, respectively; p=0.001);

- Their belief in protecting against the infection by using an N95 mask (27% and 11.1%, respectively; p=0.007);

- Their behaviors in protecting against COVID-19 by washing hands more than ever (97% and 88.9%, respectively; p=0.004); by pouring disinfectant and/or cologne on their hands frequently (94.8% and 87.3%, respectively; p=0.025); trying out to touch less often where others touch (99.4% and 95.1%, respectively; p=0.009); washing/wiping everything bought from the outside before bringing it into the home (69.4% and 55.6%, respectively; p=0.032); reducing the use of public transport (97.9% and 87.3%, respectively; p=0.000);

- Their knowledge on interception of the infection by rinsing the nose with saline (35.2% and 14.3%, respectively; p=0.001); using vinegar (28.8% and 4.8%, respectively; p=0.000); and consuming turmeric (31.8% and 19%, respectively; p=0.042);

- Their behavioral practices in protecting themselves from the infection and preventing its spread by changing the apron they wear in the pharmacy every day (48.2% and 27%, respectively; p=0.002);

- Their behavioral practices in training pharmacy staff regarding COVID-19 transmission routes (87% and 71.4%, respectively; p=0.002); regarding symptoms of COVID-19 infection (85.8% and 73%, respectively; p=0.012);

- Their behavioral practices in training patients/customers regarding personal protection precautions against COVID-19 (83.3% and 93.7%, respectively; p=0.036); regarding correct use of masks (80.9% and 93.7%, respectively; p=0.014); regarding symptoms of COVID-19 infection (78.8% and 92.1%, respectively; p=0.014).

Participants were asked to write the names of three drugs that were being used for the treatment of COVID-19 in Turkey. Hydroxychloroquine (n=226, 57.5%) was the most widely

Table 6. Participants' responses regarding the names of drugs used in the treatment of COVID-19

Name of the drug	n (%)
I do not know	38 (9.8%)
Hydroxychloroquine	226 (57.5%)
Azithromycin	197 (50.1%)
Oseltamivir	166 (42.2%)
Favipiravir	87 (22.1%)
Enoxaparin	76 (19.3%)
Paracetamol	72 (18.3%)
Clarithromycin	43 (10.9%)
Tocilizumab	42 (10.7%)
Vitamin C	35 (8.9%)
Ritonavir + lopinavir	33 (8.4%)
Ritonavir	21 (5.3%)
Remdesivir	15 (3.8%)
Vitamin D	15 (3.8%)
Doxycycline	12 (3.1%)
Acetylcysteine	9 (2.3%)
Ivermectin	3 (.8%)
Heparin	3 (.8%)
Gemifloxacin	3 (.8%)
Diosmin + hesperidin	2 (.5%)

COVID-19: Coronavirus disease-2019

mentioned drug. In the second place, azithromycin (n=197, 50.1%) was the most often named drug, followed by oseltamivir (n=166, 42.2%). In all, 9.8% (n=38) of the participants declared that they did not know the name of the drug (Table 6).

DISCUSSION

This study aimed to evaluate the knowledge and attitudes of community pharmacists about COVID-19 and the role of the media and other factors in shaping pharmacists' knowledge, perception, and attitudes during the COVID-19 pandemic.

Community pharmacists have always been the most accessible healthcare providers. The fact that they continue to ensure direct patient care despite restrictions implemented by the government because of the pandemic is another indication of this.[12] Community pharmacists have fulfilled a variety of responsibilities in sustaining the health system during COVID-19: Administering medication to patients, training patients, evaluating patients for renewal of chronic medication prescriptions, conducting counseling on minor illnesses, explaining misunderstandings about COVID-19 treatments, creating community cognizance regarding COVID-19, prevention methods, risk elements, signs, and symptoms.[12,13] Although these services vary among pharmacists, there is a relationship between the resources used and the knowledge, attitudes, and perceptions of the pharmacists about COVID-19 disease and treatment.[12]

In this study, it was determined that the participants generally preferred to obtain information from Ministry of Health/government statements, the internet (scientific sources), and the media. It was identified that the resource from which the participants ascertained information about COVID-19 and related topics has a significant impact on their knowledge and behaviors toward COVID-19 disease.

Pharmacists who used the internet (scientific sources) as an information resource had the correct approaches, particularly in terms of behaviors that offered protection from the disease (such as trying to touch less often where others touch, pouring disinfectant, and/or cologne on their hands frequently, using a mask on public transport, using a mask while traveling, working, wandering the street, using a mask in populous places). The pharmacists that obtained information from Ministry of Health/government statements also had the correct approaches to protection from the infection (such as pouring disinfectant and/or cologne on their hands frequently, not going places such as the market except when absolutely necessary, using a surgical mask). The participants that obtained information from media also had the correct approaches to protection from the illness (such as washing hands more than usual, pouring disinfectant and/or cologne on their hands frequently, trying to touch less often where others touch, reducing the use of public transport, using a mask while working, using a surgical mask). However, the participants that obtained information from the household/peers had incorrect approaches, chiefly in prevention of the infection (such as using vinegar, consuming turmeric).

Similar results to our findings were found in a study conducted to assess knowledge and attitudes of hospital pharmacists

about COVID-19. It was determined that the information resource from which the participants learned about COVID-19 and related information has a significant impact on their knowledge and behaviors toward COVID-19 disease. In addition, pharmacists that obtained information from the internet (scientific sources) had the correct approaches, whereas participants that obtained info from the household/peers had incorrect approaches, chiefly regarding interception of the illness.[14]

The participants that obtained their information from the internet (non-scientific sources) had incorrect approaches, particularly with respect to contamination by the infection (such as via blood), interception of the illness (such as consuming turmeric), and protection against the disease (such as eyeglasses and glove use). However, WHO declared that there is no scientific evidence that consuming turmeric prevents COVID-19 (https://www.who.int/southeastasia/outbreaks-and-emergencies/novel-coronavirus-2019/fact-or-fiction). In addition, WHO does not recommend using gloves. The wearing of gloves may increase the risk of infection, since it can lead to self-contamination or transmission to others when touching contaminated surfaces and then the face (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-on-covid-19-and-masks).

Some misleading information, such as washing the nose with saline or consuming it has been recommended by some doctors or certain leading people on television programs in Turkey.[14] Although these explanations were objected to and corrected by other doctors and professionals, the fact that some pharmacists preferred these applications (especially washing the nose with saline) reveals the powerful effect of the press.

In this study it was also found that the participants' attitudes differed according to the sources from which they learned about COVID-19.

It was determined that the participants who received information from social media gave less training to pharmacy staff and patients/customers about personal protection measures against COVID-19, correct use of masks, modes of COVID-19 transmission, and COVID-19 symptoms. It was determined that participants who received information from the media provided less training to patients/customers on personal protection measures against COVID-19, correct use of masks, and COVID-19 symptoms; however, it was observed that their behavior in training pharmacy staff was just the opposite of this. On the other hand, it was determined that participants who used the internet (scientific sources) and obtained information from educational/scientific meetings provided more education both to pharmacy staff and to patients/customers about personal protection measures against COVID-19, correct use of masks, modes of COVID-19 transmission, and COVID-19 symptoms.

Although there is no vaccine application as of yet, many vaccine studies are in progress, and it is hoped that COVID-19 will be prevented by vaccination in the future.[15,16] Even though no vaccine is available at present, more than half of the pharmacists in this study expressed that vaccination can prevent COVID-19, which might be owing to extrapolation of the knowledge

of other flu-like viral diseases. Most of the participants also stated that a vaccine will be developed within 6-12 months, and it will accelerate the end of the pandemic. On the other hand, 84.2% of participants stated that a drug being developed for the treatment of COVID-19 will reduce death rates due to COVID-19, whereas 73.5% of participants believed that the drug can be put up for sale without sufficient clinical studies. Many medications are being tested for the treatment of COVID-19, and the effects of these medications have been proven by some observational studies.[15,17] Some of these medications are antiretroviral drugs. In this study, more than half of the pharmacists were aware of this information.

Even though no medication has been discovered for the treatment of COVID-19 as yet, nearly all of the participants stated the names of drugs that are being used in Turkey for the treatment of COVID-19. Thus, it is understood that nearly all the participants are aware of the drugs currently being used for the treatment of COVID-19, whereas it is seen that 9.8% of the participants have no interest in this issue.

In this study it was also determined that approximately half of the participants trust the T.C. Ministry of Health the most regarding the COVID-19 pandemic process, followed by the WHO in second place. Most of the participants stated that their level of trust in the source(s) from which they obtain information about COVID-19 was between 50% and 75%.

Study limitations

This study has several limitations. The study participants were only recruited from Turkey; therefore, this study only reflects the attitudes and behaviors of community pharmacists in Turkey. The participants in this study were only a part of community pharmacists, and for this reason, the generalizability of the study sample may be limited. However, the study participants were from different cities in Turkey, and this constitutes one of the strengths of the study. Although the study results reflect pharmacists' answers from all over Turkey, not only a part of Turkey, to gain a better understanding of community pharmacists' knowledge, attitudes, and impressions about COVID-19, a wider-scale study should be performed.

CONCLUSION

The media and other sources used to obtain information affect pharmacists' knowledge, behavior, and impressions. Having a high level of knowledge positively affects people's behavior. It is also important both for the society and for themselves that pharmacists have accurate information about COVID-19 and increase their own level of knowledge. It should be the responsibility of pharmacists, who are the health profession in the closest contact with the public, to transfer the knowledge they have acquired to society by reflecting it in their behaviors and to provide patient education in order to prevent and control the spread of COVID-19.

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