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Research Article

Evaluation of Factors That Affect COVID-19 Infection in Turkish Society

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Abstract

AIM: The study aims to determine the risk factors that affect coronavirus-2019 infection in Turkey.
METHOD: This descriptive study was performed between October 18, 2020, and November 18, 2020. The online link of the form created on Google forms was sent to the participants' phones. Totally 1104 individuals from different regions of Turkey participated. Logistic regression analysis was performed to detect risk factors of coronavirus-2019 infection.
RESULTS: Most of the participants were women and university graduates. All participants except one wore masks, 96.8% paid attention to social distance, and 57.8% did not use public transportation. Of the participants, 9.8% ($n=108$) were diagnosed with coronavirus-2019 and 41.5% ($n=458$) had a coronavirus-2019-positive relative. The infection risk was higher for those who lived in the Marmara region, who went to work daily (odds ratio = 2.18; 95% CI: 1.18–4.04), who had a coronavirus-2019-positive patient where they lived (odds ratio = 3.44; 95% CI: 1.95–6.05), and who shared items with a coronavirus-2019-positive patient (odds ratio = 4.76; 95% CI: 2.64–8.58).
CONCLUSION: Sharing items with a coronavirus-2019-positive patient, living in crowded regions, and going to work daily were the main risk factors of coronavirus-2019 infection in Turkish society.
Keywords: Coronavirus-2019, protective measures, risk factors, symptoms

Introduction

Many coronavirus types that have played a key role in the development of respiratory tract infections have been defined throughout history (Saydam, 2020; Türken & Köse, 2020). As one of these coronavirus types, the coronavirus disease 19 (COVID-19) virus rapidly spread at the end of 2019 and turned into an epidemic in the Chinese city of Wuhan first and to other countries later. Many people applied to hospitals owing to upper respiratory symptoms such as fever, coughing, and dyspnea and lost their lives due to severe acute respiratory failure arising from the virus (Saydam, 2020; World Health Organization [WHO], 2020a; Zhou et al., 2020). As this epidemic rapidly grew, the World Health Organization (WHO) declared it a "pandemic" on March 12, 2020 (WHO, 2020). The number of people who were diagnosed with COVID-19 and who lost their lives owing to the disease reached a significant point (Alsubaie et al., 2019). World Health Organization reported that the number of COVID-19 patients was 78,194,947, while the number of those who lost their lives owing to COVID-19 was 1,736,752 as of December 25, 2020 (WHO, 2020b). On the same date, the number of COVID-19 patients in Turkey was 2,118,255, while the number of those who lost their lives due to COVID-19 was 19,371 in the country as reported by the Turkish Ministry of Health (Turkish Republic Ministry of Health, 2020).

Coronavirus-2019 infection occurs when the patients spread droplets by coughing or sneezing and when these droplets contact the oral, nasal, or ocular mucosa of other people. The exact duration of infection is not known, but it is believed that infection starts 2 days before the emergence of symptoms and continues until the symptoms disappear. Moreover, the duration of incubation is reported to last 5 or 6 days (Guan et al., 2020; Turkish Republic Ministry of Health Covid-19 Scientific Advisory Board, 2020).

Although the number of new cases and deaths has been increasing in the COVID-19 pandemic, there is no approved treatment method that is effective against the coronavirus. Therefore, many countries have taken national and individual measures to fight against COVID-19 and to control the infection. The main objective of decreasing the cases is by strengthening the immune system of the society (Erkal et al., 2020; Ferguson et al., 2020).

Many measures such as maintaining social distance, using a mask, ensuring hand hygiene, and establishing social isolation have been taken during this period (Harapan et al., 2020; Kurt, 2020; Turkish Republic Ministry of Health Covid-19 Scientific Advisory Board, 2020). These institutional and personal measures may decrease the infection rate regarding COVID-19. Accordingly,

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the target is to control the number of COVID-19 cases (Kurt, 2020). Nevertheless, different factors are affecting the risk of infection. Although the entire society can be considered as a sensitive host in the COVID-19 pandemic, medical personnel constitutes the riskiest group in terms of contacting the COVID-19 virus and viral loads. Additionally, being aged over 50 years, being a male, or having comorbid chronic diseases (COPD, diabetes, cancer, cardiac conditions, immune system failure, etc.) are among the factors that increase the risk of infection and affect the prognosis. Living in penitentiaries, migrant camps, outposts, and care centers is also believed to increase the risk of infection (Harapan et al., 2020; Turkish Republic Ministry of Health Covid-19 Scientific Advisory Board, 2020).

The number of studies examining the factors that affect Covid-19 infection risk is limited. The objective of this study was to examine the factors affecting the COVID-19 infection during the pandemic.

Research Questions

1. What are the factors affecting the COVID-19 infection in Turkish society?
2. Is there a difference between protective measures of COVID-19 cases and healthy people?

Method

Study Design

This was a cross-sectional study.

Sample

This study was conducted online between October 18, 2020, and November 18, 2020, in Turkey. The majority of the lands within the Republic of Turkey cover Anatolia, while a minor part covers Thrace, the southeast extension of the Balkan Peninsula. The population of Turkey is 83,154,997. Based on the natural, human, and financial characteristics, the country consists of 7 regions: Mediterranean, Eastern Anatolia, Aegean, Southeastern Anatolia, Central Anatolia, Marmara, and Black Sea. The majority of the population lives in the Marmara Region (Turkish Statistical Institute). The link of the form created on Google forms was sent to the researchers' friends, relatives, and colleagues' phones, and they were invited to participate in and forward the study to their friends. The objective of the study was explained, and participants' informed consent was obtained. Although many people were invited to participate in the study, only 1264 individuals from 7 regions of Turkey participated. A sample size of 385 produces a 2-sided 95% CI with a width equal to .100 when the sample proportion is .500 (Fleiss et al., 2003; Newcombe, 1998). The data of 1104 people who agreed to participate and completed the assessment form thoroughly were included. Data of 160 were excluded owing to answering certain items twice.

Data Collection

A 43-item questionnaire consisting of 2 parts was prepared by the researchers based on the literature. The first section questioned participants' personal characteristics (age, profession, employment status, risk of COVID-19 infection, family type, etc.) (Harapan et al., 2020; Saydam, 2020; Turkish Republic Ministry of Health Covid-19 Scientific Advisory Board), while the second section questioned the participants' compliance with 14 rules declared by the Turkish Ministry of Health to prevent the COVID-19 pandemic (using a mask, observing the hand hygiene and social distance, etc.) and whether participants were diagnosed with COVID-19 (Turkish Republic Ministry of Health Covid-19 Scientific Advisory Board). The KR-20 reliability and validity value is .505. Identity details that could help identify the participants were not questioned.

Statistical Analysis

Data were analyzed using Statistical Package for the Social Science (IBM SPSS Corp., Armonk, NY, USA) version 21. The percentage distribution, mean figures, standard deviation, minimum, and maximum values were found using descriptive statistics. To determine the effect of personal characteristics and adaptation to protective measures on COVID-19 infection, χ^2 test and Mann–Whitney *U* test were performed. Forward LR method was used in the univariate analysis to determine the general impact of all variables increasing the risk of COVID-19 infection on the disease itself, and regression analysis was performed. For the statistical assessment of the results, $p < .05$ was accepted as the statistical significance threshold.

Ethical Consideration

The ethical consent dated October 18, 2020, and numbered with protocol no 137281 (No. 2020-158) was given by the Head of the Ethics Committee of Social and Human Sciences Researches within the Rectorship of Cerrahpaşa at Istanbul University. Apart from the ethics committee approval for the study, consent was obtained from the Turkish Ministry of Health Covid-19 Research Committee on September 26, 2020 (no: 2020-09-25T14_06_08).

Results

The results were reviewed under 3 main titles: distribution of personal characteristics, adaptation to protective COVID-19 measures, and the impact of personal characteristics and adaptation to protective measures on COVID-19 infection.

Distribution of Personal Characteristics

The number of participants was 1104; most of them resided in the Marmara Region. The main group consisted of women and university graduates. The body mass index of participants was within the normal range, most of them did not smoke and drink, did not have a chronic disease, and lived with their families (Table 1).

Most participants were working in the medical or non-medical professional groups that had a low or high risk of contacting COVID-19. Half of the participants noted that they were going to work regularly every day, while 7.2% stated that they were working with COVID-19-positive patients. Of the participants, 59.4% stated that people in their neighborhoods were diagnosed with COVID-19, while 41.5% noted that their relatives were infected with COVID-19. Moreover, 33.4% reported that they generally did not go outside (Table 2).

Table 1.
The Risk of Increased COVID-19 Infection Due to Personal Characteristics

	Total, $n=1104$		COVID-19 (–), $n=996$		COVID-19 (+), $n=108$			
	n	%	n_{Exp}	%	n_{Exp}	%	χ^2	p
Gender								
Male	276	25.0	241	24.2	35	32.4	3.50	.06
Female	828	75.0	755	75.8	73	67.6		
BMI								
Underweight	58	5.3	52	5.2	6	5.6	.09	.99
Normal	606	54.9	546	54.8	60	55.6		
Overweight	320	29.0	289	29.0	31	28.7		
Obese	120	10.9	109	10.9	11	10.2		
Educational status								
Primary–high school	160	14.5	137	13.8	$23_{(16)}$	21.3	10.79	.03
Associate degree	129	11.7	120	12.0	9	8.3		
Bachelor's degree	445	40.3	399	40.1	46	42.6		
Master's degree	223	20.2	199	20.0	24	22.2		
Doctorate	147	13.3	141	14.2	$6_{(14)}$	5.6		
Housing environment								
I live alone	108	9.8	98	9.8	10	9.3	.04	.85
I live with my family/a friend	996	90.2	898	90.2	98	90.7		
History of chronic disease								
None	901	81.6	806	80.9	95	88.0	3.22	.07
Yes	203	18.4	190	19.1	13	12.0		
Smoking								
No	844	76.4	760	76.3	84	77.8	.12	.73
Yes	260	23.6	236	23.7	24	22.2		
Drinking								
No	857	77.6	773	77.6	84	77.8	.002	.97
Yes	247	22.4	223	22.4	24	22.2		
Area of residence								
Marmara region	596	54.0	517	51.9	$79_{(58)}$	73.1	27.17*	.0001
Aegean region	78	7.1	73	7.3	5	4.6		
Mediterranean region	65	5.9	64	6.4	$1_{(6)}$	0.9		
Central Anatolia region	120	10.9	107	10.7	13	12.0		
Black Sea region	152	13.8	150	15.1	$2_{(15)}$	1.9		
Eastern Anatolia region	45	4.1	42	4.2	3	2.8		
Southeastern Anatolia region	48	4.3	43	4.3	5	4.6		

Note: ^Fisher p; ^^Yates corrected chi-square.
COVID-19 = coronavirus disease 19.

Adaptation to the Protective COVID-19 Measures

This study showed that everybody excluding 1 person used a mask, 96.8% observed the social distance, 93.6% did not share items with a COVID-19-positive patient, 84.8% did not attend the meetings, 79.3% abstained from shaking hands, 61% did not go to shopping malls, and 57.8% did not use public transportation to prevent COVID-19 infection. Moreover, only 31.3% washed their hands frequently, 24.1% used a hand disinfectant, and 11.2% used a visor (Table 3).

Table 2.
Increased Risk of COVID-19 Infection by Professional and Environmental Exposure

	Total, *n* = 1104		COVID-19 (–), *n* = 996		COVID-19 (+), *n* = 108			
	n	%	n_{Exp}	%	n_{Exp}	%	χ^2	*p*
Professional group								
Medical staff	395	35.8	329	33.0	$66_{(39)}$	61.1	33.46	.0001
Non-medical staff	466	42.2	439	44.1	27	25.0		
Unemployed	243	22.0	228	22.9	15	13.9		
Risk of contacting COVID-19 due to profession								
Unemployed	317	28.7	300	30.1	$17_{(31)}$	15.7	33.45	.0001
No risk of contacting	78	7.1	75	7.5	$3_{(3)}$	2.8		
Low risk of contacting	241	21.8	226	22.7	$15_{(23)}$	13.9		
High risk of contacting	388	35.1	328	32.9	$60_{(30)}$	55.6		
Working with a COVID-19 (+) case	80	7.2	67	6.7	13	12.0		
Going to work								
No	299	27.1	283	28.4	$16_{(29)}$	14.8	37.35	.0001
Works at home	110	10.0	107	10.7	$3_{(11)}$	2.8		
Works in a flexible shift	152	13.8	146	14.7	$6_{(15)}$	5.6		
Goes to work everyday	543	49.2	460	46.2	$83_{(53)}$	76.9		
Going outside home								
Generally stays inside	369	33.4	318	31.9	$51_{(36)}$	47.2	12.63	.002
Goes outside 1 or 2 days a week	437	39.6	397	39.9	40	37.0		
Goes everyday	298	27.0	$281_{(268)}$	28.2	$17_{(29)}$	15.7		
COVID-19 (+) cases in the area of residence								
None	448	40.6	431	43.3	17	15.7	30.63	.0001
Yes	656	59.4	565	56.7	$91_{(64)}$	84.3		
COVID-19 (+) cases among the relatives								
No	646	58.5	606	60.8	40	37.0	22.75	.0001
Yes	458	41.5	390	39.2	$68_{(45)}$	63.0		

Note: ^Fisher *p*; ^^Yates corrected chi-square.
COVID-19 = coronavirus disease 19.

Impact of Personal Characteristics and Adaptation to the Protective Measures on COVID-19 Infection

Of the participants, 9.8% (*n* = 108) told that they were diagnosed with COVID-19, while 41.5% reported that their relatives (*n* = 458) were diagnosed with the disease. Of the people diagnosed with COVID-19, 46.49% (*n* = 50) did not know where they contracted the virus, while 53.71% (*n* = 58) stated they were diagnosed with the disease because they contracted a COVID-19 case. According to the results, those who were and were not diagnosed with COVID-19 had complaints related to COVID-19, but the participants who were diagnosed with COVID-19 had increased body temperature, headache, muscle–joint pain, exhaustion, loss of smell and taste, coughing, sore throat, dyspnea, and diarrhea more than expected (Table 4).

The impact of personal characteristics on COVID-19 infection was examined and gender, BMI, house environment, chronic diseases, smoking, and drinking had no impact on the increased rate of COVID-19, while the educational status and area of residence were important in this regard. Assessments indicated that the number of COVID-19 cases was higher among the primary school graduates and those living in the Marmara region more than expected, while the number of cases was lower among the graduates of doctoral programs and those living in the Mediterranean and Black Sea Regions (Table 1).

The impact of professional and environmental exposure on COVID-19 infection was examined, and the professional group, going to work, risk of contracting COVID-19 in the working environment, going outside, and diagnosis of COVID-19 among the people in participants' neighborhoods and relatives were among the significant variables. The rate of COVID-19 cases was higher than expected among those who went to work every day, worked as medical personnel, suffered a high risk of contracting

Table 3.
Impact of Adaptation to Protective Measures on COVID-19 Infection

	Total, *n* = 1104		COVID-19 (–), *n* = 996		COVID-19 (+), *n* = 108			
	n	%	n_{Exp}	%	n_{Exp}	%	χ^2	*P*
Using a mask								
Yes	1103	99.9	995	99.9	108	100.0	.11	.74
No	1	0.1	1	0.1	0	0.0		
Using a visor								
Yes	124	11.2	111	11.1	13	12.0	.08	.78
No	980	88.8	885	88.9	95	88.0		
Observing the social distance								
Yes	1069	96.8	965	96.9	104	96.3	.11	.74
No	35	3.2	31	3.1	4	3.7		
Shaking hands								
No	875	79.3	794	79.7	81	75.0	1.32	.25
Yes	229	20.7	202	20.3	27	25.0		
Washing hands frequently								
Yes	346	31.3	310	31.1	36	33.3	.22	.63
No	758	68.7	686	68.9	72	66.7		
Using a hand disinfectant								
Yes	266	24.1	243	24.4	23	21.3	.51	.47
No	838	75.9	753	75.6	85	78.7		
Using a mass transportation vehicle								
No	638	57.8	$587_{(575)}$	58.9	51	47.2	5.48	.02
Yes	466	42.2	409	41.1	57 (45)	52.8		
Going to a shopping mall								
No	673	61.0	607	60.9	66	61.1	.001	.97
Yes	431	39.0	389	39.1	42	38.9		
Participating in a meeting								
No	936	84.8	846	84.9	90	83.3	.20	.66
Yes	168	15.2	150	15.1	18	16.7		
Sharing an item with a COVID-19 case								
No	1033	93.6	952	95.6	81	75.0	68.59	.0001
Yes	71	6.4	44	4.4	$27_{(7)}$	25.0		

Note: ^Fisher *p*; ^^Yates corrected chi-square.
COVID-19 = coronavirus disease 19.

COVID-19 cases, worked with COVID-19 cases directly, had neighbors or relatives who were diagnosed with COVID-19, and stayed at home (Table 2).

The impact of social adaptation to protective measures on COVID-19 infection was examined and it was found that the main factors increasing the rate of COVID-19 infection were using a mass transportation vehicle and sharing items with a COVID-19 (+) case (Table 3), while the manner of using the mask had no impact (Table 5).

The logistic regression analysis performed using the forward LR method examined participants' educational status, participants' area of residence, occupations, state of going to work, risk of contracting COVID-19 in their working lives, state of going outside the home, having a neighbor or relative who was diagnosed with COVID-19, using a mass transportation vehicle, and the impact of sharing an item with a COVID-19 (+) case on the infection of the disease.

According to the assessments, the factors that were important in terms of increased COVID-19 infection were, respectively, as follows: sharing an item with a COVID-19 case, professional group, presence of COVID-19 case in the area of residence, the area of residence itself, going outside to visit somebody or a place, and going to work. The professional group lost its significance in the later phases. Results were compared with the Marmara region and indicated that COVID-19 infection risk was lower among those who lived in Aegean (odds ratio (OR) = 0.03; 95% CI: 0.12–0.91), Mediterranean (OR = 0.01; 95% CI: 0.01–0.58), and Black Sea (OR = 0.08; 95% CI: 0.02–0.37) region. Compared to those who did not go outside, the risk was lower among those who went outside once or twice a week (OR = 0.59; 95% CI: 0.36–0.96) or every day (OR = 0.28; 95% CI: 0.15–0.53). When compared to unemployed people, the risk was higher among those who went to work every day (OR = 2.18; 95% CI: 1.18–4.04), had a COVID-19 case in their working environments (OR = 3.44; 95% CI: 1.95–6.05) and shared an item with a COVID-19 case (OR = 4.76; 95% CI: 2.64–8.58) (Table 6).

Discussion

Coronavirus-19 is an important health problem in Turkey as well as in the world. The number of new cases is increasing day by day despite warnings of the Republic of Turkey Ministry of Health as "Stay at home! Wear a mask! Keep social distance!" (Turkish Republic Ministry of Health).

It is known that the COVID-19 virus is transmitted through droplets while talking, sneezing, or coughing, or contact between people (Lotfi et al., 2020). A study reported that the weight of the COVID-19 virus was less than 5 μm and stayed in the air for longer than 3 hours (van Doremalen et al., 2020). Therefore, social distancing, using a mask, ventilation, and utilizing a suitable disinfectant are among the effective

Table 4.
Frequency of Complaints Among COVID-19-Positive and Negative Individuals

	COVID-19 (−), $n=996$			COVID-19 (+), $n=108$				
	n	n_{Exp}	%	n	n_{Exp}	%	χ^2	p
Presence of COVID-19								
No	821	783.1	82.4	47	84.9	43.5	87.78	.0001
Yes	175	212.9	17.6	61	23.1	56.5		
Increase in body temperature (fever)								
No	984	962.6	98.8	83	104.4	76.9	138.14	.0001^^
Yes	12	33.4	1.2	25	3.6	23.1		
Headache								
No	925	905.8	92.9	79	98.2	73.1	46.01	.0001
Yes	71	90.2	7.1	29	9.8	26.9		
Muscle–joint pain								
No	932	904.9	93.6	71	98.1	65.7	90.81	.0001
Yes	64	91.1	6.4	37	9.9	34.3		
Exhaustion								
No	929	901.3	93.3	70	97.7	64.8	91.68	.0001
Yes	67	94.7	6.7	38	10.3	35.2		
Loss of smell and taste								
No	988	966.2	99.2	83	104.8	76.9	160.15	.0001^^
Yes	8	29.8	0.8	25	3.2	23.1		
Coughing								
No	965	950.0	96.9	88	103.0	81.5	49.04	.0001^^
Yes	31	46.0	3.1	20	5.0	18.5		
Sore throat								
No	918	905.8	92.2	86	98.2	79.6	18.59	.0001
Yes	78	90.2	7.8	22	9.8	20.4		
Dyspnea								
No	985	980.7	98.9	102	106.3	94.4		.004^
Yes	11	15.3	1.1	6	1.7	5.6		
Diarrhea								
No	969	956.3	97.3	91	103.7	84.3	39.89	.0001^^
Yes	27	39.7	2.7	17	4.3	15.7		

Note: ^Fisher p; ^^Yates corrected chi-square.
COVID-19 = coronavirus disease 19.

approaches for preventing the spread of the virus, and the entire Turkish society should take these measures as suggested by the Turkish Ministry of Health (Turkish Republic Ministry of Health Covid-19 Scientific Advisory Board). Using the correct mask is important for preventing the spread. All participants of the present study, excluding one in the COVID-19-negative group, stated that they used a mask. Those infected with COVID-19 noted that the infection occurred through long-term contact (30%) or short-term contact (28%) when they wore a mask. The occurrence of the infection when wearing a mask indicates that the mask is not worn properly in Turkish society.

The mask should be changed every day, after getting moist, damaged, or dirty during this pandemic. Most of the participants in the present study reported that they changed their masks every day. However, there were also participants who changed their masks as they got dirty. A study reported that masks should be changed a couple of times a day as masks get moist during the day (Sommerstein et al., 2020). Therefore, to prevent

Table 5.
Impact of the Manner of Using a Mask on COVID-19 Infection

	Total, *n* = 1104		COVID-19 (–), *n* = 996		COVID-19 (+), *n* = 108			
	n	%	n_{Exp}	%	n_{Exp}	%	χ^2	*p*
Abstaining from wearing a mask								
No	1016	92.0	914	91.8	102	94.4	.95	.33
Yes	88	8.0	82	8.2	6	5.6		
Type of the mask								
3M N95	25	2.3	24	2.4	$1_{(3)}$	.9		.50^
Medical mask	1078	97.6	971	97.6	107	99.1		
Manner of using a mask								
In a manner to cover the mouth and nose	1090	98.7	985	99.0	105	97.2		.13^
In a manner to cover the mouth solely	13	1.2	10	1.0	3	2.8		
Frequency of changing the mask								
A couple of times a day	113	10.2	99	9.9	14	13.0	2.44	.29
Everyday	727	65.9	663	66.6	64	59.3		
After getting dirty	263	23.8	233	23.4	30	27.8		
Using a mask in a meeting								
Used constantly	144	85.7	129	86.0	15	83.3		.72^
Removed and wore occasionally	24	14.3	21	14.0	3	16.7		

Note: ^Fisher *p*; ^^Yates corrected chi-square.
COVID-19 = coronavirus disease 19.

Table 6.
Logistic Regression of the Factors Increasing the Risk of COVID-19 Infection

							95% CI for EXP(B)	
Step 7[f]	**B**	**SE**	**Wald**	***df***	**Sig.**	**Exp(B)**	**Lower**	**Upper**
Marmara region (ref)			22.38	6	.001			
Aegean region	–1.10	.51	4.56	1	.03	.33	.12	.91
Mediterranean region	–2.58	1.05	6.06	1	.01	.07	.01	.58
Central Anatolia region	–0.35	.34	1.04	1	.30	.70	.35	1.38
Black Sea region	–2.42	.73	10.83	1	.001	.08	.02	.37
Eastern Anatolia region	–1.22	.65	3.47	1	.06	.29	.08	1.06
Southeastern Anatolia region	–0.32	.54	.35	1	.55	.72	.25	2.09
Unemployed (ref)			17.85	3	.000			
Works at home	–0.99	.65	2.30	1	.12	.36	.10	1.33
Works in a flexible shift	–0.41	.50	.66	1	.41	.66	.24	1.78
Goes to work every day	0.78	.31	6.25	1	.01	2.18	1.18	4.04
Presence of COVID-19 case in the area of residence	1.23	.28	18.40	1	.0001	3.44	1.95	6.05
Generally stays inside (ref)			16.27	2	.0001			
Goes outside 1 or 2 days a week	–0.51	.24	4.39	1	.04	.59	.36	.96
Goes outside everyday	–1.24	.31	15.71	1	.0001	.28	.15	.53
Sharing an item with a COVID-19 case	1.56	.30	26.96	1	.0001	4.76	2.64	8.58
Constantly	–2.82	.37	55.84	1	.0001	.05		

SE = standard deviation; COVID-19 = coronavirus disease 19.

the spread of the virus, people should be informed that masks should be changed immediately when they get moist or dirty.

A meta-analysis comparing medical mask and N95 mask to prevent different infections showed that N95 was not superior to the medical mask in terms of protection from viral infection (OR=1.06, 95% CI: 0.90–1.25) or influenza (OR=0.94, 95% CI: 0.79–1.20) (Bartoszko et al., 2020). Centers for Disease Control and Prevention (CDC) recommend that the exhalation valves found in the N95 mask do not prevent the COVID-19 infection, and hence, this mask should not be used in social life (Center for Disease Control and Prevention [CDC], 2020).

Coronavirus-19 contamination was reported to be positive in the hospital rooms of COVID-19 cases and surfaces of the residential areas where cases lived (Yamagishi et al., 2020). According to a study, cases were easily infected by the virus through their oral, nasal, or ocular mucosa after contacting the areas contaminated with COVID-19 (Lotfi et al., 2020). The frequency of using hand disinfectants and hand hygiene habits among the COVID-19 cases and healthy participants in the study showed no difference.

Hand hygiene is an important precaution to prevent the infection of COVID-19. An observational study indicated that people touched their oral/nasal mucosa more than 3 times in an hour in outdoor areas (Alonso et al., 2013). Considering the position of the mask and the contact with it, the rate of touching the mask is believed to be higher. Thus, social awareness should be raised to improve the habit of hand hygiene and social health.

A study that assessed the infection rates among those who contacted COVID-19 cases through a house visit or within a house environment indicated that the regional rate of developing secondary infection at home ranged between 4% and 36% (Fung et al., 2021). Results indicated that 84.3% of those who suffered COVID-19 had COVID-19 cases in their area of residence. An assessment of those whose relatives were COVID-19 cases indicated that the number of COVID-19 cases was higher than those who were not. A study conducted in Spain reported that households were exposed to a greater risk of infection compared to the exposure outside the house (Pollán et al., 2020).

World Health Organization recommends staying at home, abstaining from unnecessary traveling, following social distancing rules, abstaining from contacting symptomatic and asymptomatic patients in the pandemic. This study that most of the participants who were infected with COVID-19 and who were healthy went to work every day and were exposed to a high risk of contracting COVID-19 cases.

The quarantine period is critical in reducing contact with COVID-19 cases. Despite showing symptoms, people may work due to the fear of being excluded and losing their jobs, and participating in organizations. Therefore, it is important to monitor those who were infected with COVID-19 and suffered a high risk of contracting a COVID-19 case during the quarantine period. The patient follow-up and filiation teams that will monitor patients at home should be organized in a manner to perform the follow-up daily.

Going outside the home for socialization, gathering with many people in closed environments, using public transportation, participating in activities such as weddings or meetings are among the important risk factors for the spread of COVID-19. This study found that the rate of using public transportation among COVID-19 cases was high. A person who travels with a COVID-19 case is under a great risk owing to close contact for a long period. A study reported that the mean rate of attack among the passengers who traveled with 2334 index cases on the same rows for 0–8 hours was 1.5% (95% CI: 1.3%–1.8%), which was higher compared to other rows (0.14%, 95% CI: 0.11%–0.17%) (Hu et al., 2021). Traveling on the same row should be performed by leaving a seat unoccupied and limiting the duration of traveling to 3 hours (Hu et al., 2021). Therefore, to reduce risky movement and contact, remote working should be promoted or shifts should be reorganized, the number of people using public transportation should be limited, and rules should be strictly followed.

Conclusion and Recommendations

Although it is known that the risk of infection through social contracting after social or professional meetings is also significant. As people neglect the use of masks in locations such as restaurants, the probability of infection in such places was noted to be high. A study with 154 COVID-19 cases and 160 people in the control group indicated that the rate of going to a restaurant in 2 weeks was higher in cases (OR=2.4, 95% CI: 1.5–3.8) compared to the control group (Fisher et al., 2020). In a study, 53 out of 61 people who participated in a choir lasting 2.5 hours were infected with COVID-19, which was associated with singing, neglecting social distancing rules, and sharing the same snacks (Hamner et al., 2020). Studies showed that the reason for the infections that spread from a single index case to many people was exposure to crowded groups in a closed environment (Adam et al., 2020).

Sharing items with a COVID-19-positive patient, living in crowded regions, and going to work daily were the main risk factors of COVID-19 infection in Turkish society. Therefore, to prevent the spread of the virus, people should be prevented from being in crowded environments and necessary precautions should be taken in these environments. In addition, if possible, people's online work should be supported.

Ethics Committee Approval: This study was approved by Ethics committee of İstanbul University-Cerrahpaşa University (Date: October 6, 2020, Approval No: 74555795-050.01.04-2020-158).

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