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Preventive Measures for COVID-19 Infection and the Attitudes of Individuals: A Sample in Turkey

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Abstract

BACKGROUND/AIMS: This study aimed to determine the knowledge and beliefs of individuals regarding coronavirus disease-2019 (COVID-19) and its transmission pathways, their sources of information, their practice status of preventive measures and related factors.

MATERIALS AND METHODS: One thousand and four hundred and forty-four people completed a questionnaire between March 22, 2020, and April 6, 2020. The 12-question questionnaire consisted of questions regarding socio-demographics, information sources, the beliefs of the participants, and their practices to prevent the transmission of COVID-19. The data were analyzed using chi-square, t-test and One-Way ANOVA for comparisons.

RESULTS: The participants had sufficient knowledge about COVID-19 and its preventive measures. They were using social media platforms, official websites, and the TV news to obtain information about COVID-19. The rates of belief in the recommended measure and practicing these measures, such as keeping social distance, hand-washing, staying at home, avoiding public transportation and using disinfectants were quite common. Data showed that women, people living in cities, healthcare workers, and regular commuters believed in the measures more, however, their level of anxiety and seeing themselves and their environment as being risk were higher as well.

CONCLUSION: Despite all the positive results regarding COVID-19 and its preventive measures, the fact that it has spread rapidly indicates the need for more studies to continuously evaluate what is changing in this process as time passes.

Keywords: COVID-19, preventive measures, demography, society attitudes

INTRODUCTION

The coronavirus disease-2019 (COVID-19) is a respiratory disease caused by a new coronavirus. It first appeared in Wuhan, China in December 2019. The disease is highly infectious, and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea. It is also characterized by acute respiratory distress syndrome, septic shock, difficult-to-tackle metabolic acidosis, and bleeding and coagulation dysfunction.[1-3] The World Health Organization (WHO) declared an international public health emergency on January 30, 2020, urging all countries to cooperate to prevent the fast spread of COVID-19.[4,5] Following this, it was declared a pandemic on March 11, 2020.[6]

What has happened from the beginning and during the pandemic has shown that the management of the outbreak depends primarily on people's compliance with and their implementation level of the recommended measures. Strict infection control measures are the primary intervention to minimize the spread of the virus in both healthcare settings and the community.[7,8]

One of the main components of the studies regarding the prevention of transmission and spread in the pandemic is the ability of individuals in the society to carry out measures as recommended. Although the biological characteristics of COVID-19, such as the genetic type,

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structural and chemical features are very important to treat the disease, to be able manage the pandemic, this information should be usable and should be understood by lay-people. Managing the anxieties, fears and conceptual misconceptions of individuals in the community -at the local and/or wider public level- is as important as treating patients individually. As stated in the Health Belief Model, health behaviors are greatly influenced by people's knowledge, perception and attitudes.[5,9,10]

Lessons learned from the SARS epidemic in China, in 2003, showed that knowledge and attitudes towards infectious diseases can make it difficult to prevent the spread of the disease.[5,11,12] The awareness of individuals in the community to cope with highly contagious respiratory diseases plays a vital role in limiting the spread of infection, especially in middle and low-income countries whose health systems do not have the capacity to respond well to epidemics.[7,13]

Observing/following what human behavior is and how it evolves during the pandemic will make it easier to manage the unseen part of this pandemic now and in the future. The situations which direct the movements of the crowd as well as individuals should be investigated in detail and these movements or tendencies should be directed so as to facilitate the fight against COVID-19. With this in mind, this study aimed to reveal people's knowledge and beliefs about the coronavirus infection and the preventive measures, and their sources of information, as well as to determine the level of implementation of the recommended preventive measures.

In this context, when the literature is reviewed, although the countries of the studies were different for severe acute respiratory syndrome (SARS) and COVID-19, the researchers generally found that individuals in the society have a high level of knowledge. Also, in these studies, the usage of social media as a source of information was prominent but the belief that an individual's compliance with the recommended measures would be protective was found to be low. Additionally, it was also stated that individuals approached some measures that are frequently found on social media in a positive way but are actually ineffective in preventing transmission. The differences such as gender, socio-cultural features, age, education level and economic status were also shown as significant variables in terms of believing in and complying with the recommended preventive measures.[5,7,14,15]

In studies related to healthcare professionals, it has been stated that the level of knowledge about the pandemic, attitudes towards precautions, risk perception and anxiety varied according to their occupational groups, age and gender, and as to whether the healthcare professionals also used social media as a source of information.[16-18] There were no studies addressing this subject in Turkey.

This study aimed to investigate the source of information obtained by individuals, how this information guided their behaviors, their thoughts and beliefs regarding these new situations and their practice of preventive measures, and also the relationship of their sociodemographic characteristics with these variables. We believe that an understanding of these features would contribute to the sustainability of the preventative measures in the long term and would guide any further measures to be taken in the future. The answers to the following questions were sought:

1. What are the beliefs related to preventive measures against coronavirus transmission and what are their related factors?
2. What are individuals' thoughts about becoming infected or feeling at risk and the related factors with these variables?
3. What are the opinions about the implementation of precautions stated to be protective against contagion and becoming sick and what are their related factors?

MATERIALS AND METHODS

Type of Research

This study was planned as a descriptive and correlational research.

The Population and the Sample

In calculating the sample size, a 95% confidence interval and 0.05 error were considered. In cases where the number of the population is not known exactly, when p=0.05 (q=0.05 d= 0.03) is selected from the standard table and considering the estimated number of the population as 100 million, the determined number was 1067. The inclusion criteria for this study were as follows; being voluntary, being able to understand Turkish and being at least 18 years of age. There were no specific exclusion criteria. Those questionnaires which were not completed entirely and those questionnaires filled in by individuals under 18 years old were excluded from the evaluation.

Data Collection

The data were collected through a digital questionnaire prepared by the researchers using the online Qualtrics System. In the beginning part of the questionnaire, participants read the Informed Consent Form to learn about the purpose and the content of the research, its duration, confidentiality, and the participation criteria, and those who gave approval were expected to complete the survey. No fee was paid to the subjects participating in this study. The questionnaire was delivered to individuals and groups via social media and e-mail using the snowball method. A total of 1528 entries were made to the digital survey between March 22, 2020, and April 6, 2020. When those questionnaires that were not answered properly, those that were left incomplete and those which did not meet the inclusion criteria were eliminated, the sample group consisted of 1444 people.

The Data Collection Form consists of 12 questions which investigate the sociodemographic characteristics of the participants, the individuals they live with, the presence of any diagnosed chronic diseases, and the information sources they follow. In addition, their feelings and thoughts about the coronavirus infection, and their level of belief in the efficacy of preventive measures for the transmission of coronavirus were also asked. The participants were asked to rate their level of belief regarding the preventive measures by answering "it does not protect" for 0 points to "it fully protects" for 10 points, and the statements about the level/adequacy for the recommended preventive measures and their state of knowing as "not enough" for 1 point to "excellent/fully sufficient" for 10 points. The internal consistency coefficient of these questions was calculated to be 0.83.

Statistical Analysis

The data of this study were analyzed using the IBM Statistical Package for Social Science (SPSS) version 26.0 (SPSS IBM Corp, Armonk, NY, USA). The independent variables of this study were age, gender, educational status, marital status, profession, economic status, people living together, chronic disease status and sources of information. The

dependent variables were the individuals' feelings and thoughts about coronavirus infection and their belief scores for practices which will prevent coronavirus transmission. Percentages, and arithmetic means from descriptive statistics in the analysis of data were calculated. The chi-square, t-test and One-Way ANOVA were used for comparisons.

RESULTS

The average age of the participants was 39.43±13.45 years (18–77) (median: 39 years), 80% (n=1,147) were female, 50.8% (n=727) were married and 50% (n=719) were found to have a regular job with a salary. 90.5% of the participants (n=1302) had a university or higher education level and 59.1% (n=847) stated that their income was equivalent to their expense. In addition, 20.5% (n=291) were healthcare workers, 21.7% (n=307) are academicians, 21.3% (n=301) were white collar workers, 511.6% (n=167) were students, and 86.6% (n=1245) were living in cities. 30.1% (n=426) of the participants stated that they work from home and 27% (n=384) still commute to work. The rate of those living alone was 12.9% (n=185). 72.1% of the participants (n=979) stated that they do not have any diagnosed disease and 21.1% (n=287) stated that they take regular medication. The age groups of the participants and the sources of information are displayed in Table 1. Comparing the information sources with age, it was observed that there was a statistical difference between the average age of those who follow scientific publications and sites (38.03±13.24 years) and those who follow the TV news (43.99±13.29 years). The TV followers were significantly older than the scientific sites followers (F=12.802; p=0.001). The participants were asked to rate their beliefs regarding the efficacy of the measures that were frequently shared on social media and the TV news for the purpose of coronavirus prevention. They mostly marked hand-washing, social distancing and ventilating houses etc. as 8 or more, but they gave an average of 5 points to wearing a mask (Table 1).

The comparison of the self-evaluation scores of the participants regarding their belief in the protectiveness of the measures taken and their practices in terms of their gender is shown in Table 2. Although the scores regarding their beliefs in the protectiveness of measures and self-evaluation were generally higher in women, it was observed that the women had higher levels of stress than the men did, and they got lower scores on reassuring themselves than the men.

Table 3 displays the beliefs and the preventative measure implementation levels according to age groups in general. The level of believing that using vitamins, ventilating items and warm weather will protect, and generally believing in measures seems to increase with age. Although the risk perception is lower in the 18–29 age group compared to other groups, their ability to focus their attention on another subject and to reassure themselves appears to be low.

Table 4 displays the differences between the education levels in terms of having belief in the measures and self-evaluations. In general, there was no difference among the educational levels in terms of the individuals' beliefs in the efficacy of measures, but their belief increased as the education level decreased in terms of those practices for which the protection is not clear. Those who had primary education level considered the level of implementation of the measures in the society to be insufficient compared with those with postgraduate education. In terms of hand-washing levels, the high school group gave themselves higher scores than the graduate group. In addition, considering themselves at risk was lower in the university group than in the other groups and their belief that they would recover was higher.

Belief in using alcoholic disinfectants was lower among those living in the village compared to the other groups. Belief in the protection of sunny weather was lower among those living in the inner city. While the level of knowledge about the coronavirus was higher among those living in the inner city; those living in the village rated their level of taking preventive measures with lower scores (Table 5). In the group working from home, the belief that not getting on public transportation would protect them was higher, and the belief that ventilating the house/items would protect them was lower. The level of practicing preventive measures, such as hand-washing and exercising adequately were found to be lower in the group that said that they commute to work. However, in this group, feeling at risk and worrying about themselves and their

Table 1. Age, the source of information and the mean scores of believing in the efficacy of the preventive measures

Age	**n**	**%**
18–29	384	30.1
30–39	266	20.8
40–49	254	19.9
50–59	294	23.0
60–77	79	6.2
Information resources*		
Social media (Facebook, LinkedIn, Twitter, WhatsApp, Instagram)	1108	77.0
Scientific publications and websites (WHO, Ministry of Health)	1088	75.6
TV News	1101	76.5
Health professional acquaintances	637	44.3
Newspapers	387	26.9
YouTube	312	21.7
Ekşi sözlük web site (eksisozluk.com)	80	5.6
Other	45	3.1
Belief in the proposed precautions (min: 1 – max: 10)	**n**	**Mean ± SD**
Social distancing	1326	9.18±1.48
Staying at home	1429	8.80±1.80
Hand-washing	1430	8.76±1.53
Not using public transportation	1412	8.60±2.19
Ventilating the house/rooms	1425	8.32±1.94
Drinking water	1426	8.10±2.17
Using alcohol disinfectant	1401	7.68±2.41
Having COVID-19 test - PCR	1372	7.19±2.72
Warm-sunny weather	1402	6.84±2.70
Taking vitamin supplements	1387	6.10±2.80
Being under the 30 years old	1310	6.03±2.96
Wearing gloves	1382	5.98±2.89
Wearing mask	1394	5.67±2.79
Taking some medicines talked about by mess media in advance	1221	2.98±2.45

*Multiple answers, min: minimum, max: maximum, WHO: World Health Organization, COVID-19: coronavirus disease-2019, PCR: polymerase chain reaction, n: number.

Table 2. The comparisons of gender with believing in the efficacy of preventive measures related to COVID-19 and self-evaluation scores

Belief in the precautions	Male (mean ± SD)	Female (mean ± SD)	t-test	p-value
Social distancing	9.01±1.44	9.22±1.49	-1.971	0.049
Hand-washing	8.52±1.61	8.82±1.50	-2.970	0.003
Staying at home	8.46±2.01	8.88±1.73	-3.194	0.002
Not using public transportation	8.27±2.32	8.69±2.15	-2.824	0.005
Ventilating the house/items	7.92±2.08	8.42±1.89	-3.853	0.001
Drinking water	7.60±2.26	8.24±2.12	-4.450	0.001
Wearing gloves	5.56±2.88	6.09±2.88	-2.695	0.007
Taking vitamin supplements	5.50±2.87	6.17±2.76	-3.563	0.001
Wearing mask	4.94±2.75	5.86±2.77	-4.895	0.001
Self-evaluation				
Efficacy of hand-washing	8.82±1.51	9.23±1.14	-4.115	0.001
Efficacy of general fulfillment of proposed measures	8.01±1.59	8.50±1.58	-4.629	0.001
Knowledge about coronavirus symptoms	7.90±1.95	8.35±1.72	-3.476	0.001
Efficacy of knowing where to apply if infected	7.73±2.55	8.32±2.24	-3.521	0.001
Efficacy of applying healthy nutrition measures at home	7.95±1.86	8.38±1.82	-3.545	0.001
Worrying about catching coronavirus infection	5.47±2.68	6.21±2.62	-4126	0.001
Concern about family members catching the coronavirus	6.52±2.77	7.56±2.61	-5.555	0.001
Efficacy of being able to concentrate on the other issues other than coronavirus	6.92±2.46	6.33±2.50	3.506	0.001
Efficacy of being able to relax at home	7.33 ±2.20	6.87±2.38	2.882	0.001

COVID-19: coronavirus disease-2019, SD: standard deviation.

Table 3. The comparisons of age with believing in the efficacy of preventive measures related to COVID-19 and self-evaluation scores

Believing in the precautions	18–29 Mean ± SD	30–39 Mean ± SD	40–49 Mean ± SD	50–59 Mean ± SD	60–77 Mean ± SD	F#	p-value
Taking vitamin supplement	5.67±2.84[6]	5.88±2.85	6.17±2.74	6.32±2.77[6]	6.10±2.81	2.541	0.038
Ventilating the house	7.87±2.24[2]	7.59±2.27	7.91±2.25	8.18±2.06	8.31±2.25[2]	3.123	.014
Warm-sunny weather	6.11±2.91[4]	6.53±2.69	6.78±2.72	7.65±2.20	7.96±2.21	18.20	.001
Being under the 30 years old	6.19±2.99[7]	5.30±3.05[7]	6.25±2.71	6.28±2.96	6.11±2.94	4.670	.001
Self-evaluation							
Efficacy of faith in the proposed measures	6.70±2.33	6.56±2.35[1]	7.13±2.24[1]	7.06±2.22	7.31±2.17	3.757	.005
Efficacy of implementing precautions in the immediate environment	6.77±2.35[3]	7.03±2.30	7.39±2.08[3]	7.40±2.01	7.44±2.05	5.074	.001
Efficacy of applying healthy nutrition measures at home	7.76±2.27[4]	8.27±1.70	8.70±1.48	8.50±1.57	8.50±1.68	12.41	.001
Efficacy of exercising at home	4.42±2.98[4]	4.96±2.95	5.53±2.97	5.58±2.72	5.61±2.64	9.173	.001
Worrying about catching coronavirus infection	5.93±2.71	6.36±2.59[5]	6.11±2.76	6.04±2.43	5.29±2.70[5]	14.13	.001
Efficacy of being able to concentrate on the other issues	6.25±2.66[6]	6.02±2.58	6.60±2.36	6.79±2.23	7.17±2.22[6]	5.758	.001
Efficacy of being able to relax at home	6.43±2.57[4]	6.61±2.29	7.54±2.17	7.28±2.06	7.81±2.08	14.67	.001
Feeling at risk	5.29±2.85[3]	5.84 ±2.73	6.25±2.88[3]	5.89±2.55	5.92±2.77	4.833	.001
Believing I would recover, if I become infected	5.27±2.81[7]	5.98±2.59[7]	6.02±2.62	5.81±2.32	5.65±2.66	4.343	.002

One-Way ANOVA post hoc: *TUKEY*

[1]40–49 significantly higher than 30–39, [2]18–29 significantly lower than 60–77, [3]18–29 significantly lower than 40–49, [4]18–29 significantly lower than other groups,[5]30–39 significantly higher than 60–77, [6]18–29 significantly lower than 50–59,[7]18–29 significantly lower than 30–39.

COVID-19: coronavirus disease-2019, SD: standard deviation.

Table 4. The comparisons of education level with believing in the efficacy of preventive measures related to COVID-19 and self-evaluation scores

Believing in precautions	Primary (mean ± SD)	High School (mean ± SD)	University (mean ± SD)	Graduate (mean ± SD)	F#	p-value
Using alcohol disinfectants	8.60±2.41	8.13±2.24	7.68±2.37	7.52±2.53	2.738	0.042
Ventilating the house	9.19±1.66	8.94±1.74[1]	8.33±1.90*	8.08±2.04*	7.247	0.001
Ventilating items	8.59±2.85	8.49±2.16*	8.03±2.06*	7.59±2.39[2]	6.903	0.001
Warm-sunny weather	7.54±2.50	7.65±2.68[1]	6.83±2.69*	6.62±2.69*	4.615	0.003
Drinking water	9.09±1.41	8.74±1.81[1]	8.12±2.13*	7.86±2.32*	6.426	0.001
Having COVID-19 test-PCR	7.70±3.37	8.34±2.23*	7.87±2.68*	7.32±2.93[2]	5.281	0.001
Self-evaluation						
Efficacy of fulfillment of precautions in the society	2.45±2.28[3]	3.49±2.26	3.56±2.10	3.76±1.92*	2.981	0.030
Efficacy of hand-washing	9.04±1.46	9.36±1.06[1]	9.18±1.21*	9.01±1.30*	3.028	0.029
Feeling at risk	6.05±3.11	6.30±2.78	5.67±2.79[4]	6.23±2.74	4.526	0.004
Believing I would recover, if become infected	5.00±3.08	5.24±2.77	5.87±2.62[5]	5.59±2.50	3.036	0.028

#One-Way ANOVA, Post hoc: TUKEY.
[1]High-school group significantly higher university and graduate group,[2]Graduate group significantly lower than university and high school group,[3]Primary school group significantly lower than graduate group,[4]University group lower than other groups,[5]University group higher than other groups.
COVID-19: coronavirus disease-2019, SD: standard deviation, PCR: polymerase chain reaction.

Table 5. The comparisons of the residential location and the type of work of the participants with regards to believing in the efficacy of preventive measures related to COVID-19 and self-evaluation scores

Believing the precautions	Inner city (mean ± SD)	County (mean ± SD)	Village (mean ± SD)	F#	p-value
Using alcohol disinfectants	7.70±2.40	7.71±2.39	6.17±2.60[1]	3.373	0.035
Warm-Sunny weather	6.75±2.73[2]	7.49±2.47	7.40±2.22	5.652	0.004
Self-evaluation					
Knowledge about coronavirus infection	7.71±1.78[3]	7.39±2.06	6.94±178	3.523	0.030
Efficacy of implementing precautions	8.29±1.79	8.44±1.68	6.82±2.21[1]	6.355	0.002
	Working from home	**Commuting to work**	**Not working**		
Self-evaluation					
Knowing where to apply if infected	7.82±2.50[1]	8.50±2.11	8.28±2.28	9.501	0.001
Efficacy of general implementation of proposed measures	8.47±1.43	8.10±1.75[5]	8.52±1.57	8.923	0.001
Efficacy of implementation of precautions in the society	7.35±2.03	6.95±2.22[3]	7.06±2.32	3.655	0.026
Efficacy of hand-washing	9.17±1.09	9.02±1.36[4]	9.22±1.24	4.866	0.041
Efficacy of applying healthy nutrition measures at home	8.48±1.63[2]	8.19±1.88	8.20±1.94	3.553	0.029
Efficacy of exercising at home	5.45±2.94	4.44±2.88[5]	5.14±2.90	12.195	0.001
Efficacy of sleeping	7.56±2.44[1]	6.89±2.53	6.91±2.57	10.026	0.001
Worrying about catching coronavirus infection	5.87±2.67	6.63±2.66[5]	5.85±2.59	11.686	0.001
Concern about family members catching the coronavirus	7.16±2.80	7.73±2.59[5]	7.31±2.58	4.906	0.008
Efficacy of being able to concentrate on the other issues other than coronavirus	6.52±2.49	6.03±2.52[5]	6.62±2.46	6.832	0.001
Feeling at risk	5.56±2.59	7.32 ±2.71[5]	5.19±2.65	78.842	0.001
Believing I would recover, if infected	5.75±2.57	6.03 ±2.56[4]	5.54±2.65	3.984	0.019

#One-Way ANOVA Post hoc:TUKEY
[1]Village group significantly lower than other groups, [2]Inner city group lower than county group, [3]Inner city group higher than other groups.
[1]Working at home group different from the other groups, [2]Working at home group different from not working group, [3]Working outside group different from working at home group, [4]Working outside group different from not working group, [5]Working outside group different from the other groups.
COVID-19: coronavirus disease-2019, SD: standard deviation.

Table 6. The comparisons of the occupation with regards to believing in the efficacy of preventive measures related to COVID-19 and self-evaluation scores

Believing in the precautions	Academics (mean ± SD)	Unclassified jobs (mean ± SD)	Health professionals (mean ± SD)	Students (mean ± SD)	Psychosocial professionals (mean ± SD)	F#	p-value
Hand-washing	8.81±1.63	8.57±1.68*	8.97±1.31[1]	8.63±1.50*	8.55±1.48*	3.046	0.010
Wearing mask	5.83±2.76	5.16±2.63*	6.44±2.75[1]	5.22±2.74*	4.85±2.55*	10.04	0.001
Ventilating house/room	8.45±1.88*	8.15±2.02	8.41±1.88*	8.11±2.01	7.94±1.88[3]	3.045	0.010
Drinking water	8.21±2.09	7.79±2.34*	8.32±2.00[1]	7.97±2.26*	7.63±2.41*	4.780	0.001
Warm-sunny weather	7.30±2.48*	6.97±2.56*	6.84±2.58*	5.76±3.02	5.61±2.87[4]	13.73	0.001
Wearing gloves	6.06±2.75	5.65±2.79*	6.00±2.98	6.30±3.00[2]	5.47±2.72*	2.816	0.015
Taking the medicines published by media	3.41±2.60*	3.10±2.54*	2.93±2.47*	2.28±2.07	2.16±1.67[4]	6194	0.001
Being younger than 30	6.16±2.90	5.74±3.06	6.40±2.67[1]	6.40±2.85	5.40±3.14*	3.002	0.011
Self-evaluation							
Knowledge about coronavirus infection	7.72±1.84	7.44±1.91*	7.54±1.59	7.96±1.72[1]	7.71±1.81	2.827	0.015
Knowing where to apply if infected	8.28±2.26*	7.44±2.66*	8.17±2.25*	8.94±1.68[1]	8.41±2.25	14.41	0.001
Efficacy of general implemnetation of proposed measures	8.49±1.45	8.16±1.77*	8.32±1.59	8.57±1.50[1]	8.41±1.64	2.478	0.030
Efficacy of implementation of precautions of my immediate environment	7.18±2.16	7.37±2.08*	7.58±1.91*	7.01±2.18[1]	6.78±2.47	3.128	0.008
Efficacy of hand-washing	9.24±1.14	9.06±1.27*	8.88±1.39*	9.26±1.18[1]	9.03±1.29	2.428	0.033
Efficacy of general implementation of precautions at home	8.47±1.45*	8.18±1.74	7.96±2.03	8.45±1.64*	7.83±2.24[2]	4.494	0.001
Efficacy of applying healthy nutrition measures at home	8.72±1.42[5]	8.29±1.69	7.89±2.06	8.24±1.94	7.60±2.43	9.230	0.001
Efficacy of exercising at home	5.56±2.67[5]	5.15 ±3.00	4.52 ±2.99	4.55 ± 2.97	4.62 ±2.95	5.655	0.001
Worrying about catching coronavirus infection	6.00±2.55	5.89±2.69	5.64±2.42	6.70±2.73[1]	5.48±2.58	5.794	0.001
Concern about family members catching coronavirus	7.16±2.65*	7.19±2.74*	6.96±2.83*	7.88±2.46[1]	7.96±2.19	5.666	0.001
Efficacy of being able to relax at home	7.02±2.31*	6.96±2.40*	7.16±2.20*	6.75±2.30	6.48±2.54[2]	3.463	0.004
Feeling at risk	5.78 ± 2.62	5.75 ±2.75	5.20 ±2.34	7.21±2.86[1]	4.58± 2.60	23.16	0.001

#One-Way ANOVA Post hoc:*TUKEY*.
[1]Health professionals significantly different from other groups,[2]Students significantly different from general workers and psychosocial professionals,[3]Psychosocial professionals significantly different from health professionals and academicians,[4]Psychosocial professionals significantly different from health professionals, general workers and academicians,[5]Academicians significantly different from other groups.
COVID-19: coronavirus disease-2019, SD: standard deviation.

family were higher. Again, in this group, being able to pay attention to issues other than coronavirus was found to be lower than in the other groups (Table 5).

While healthcare professionals' levels of belief that hand-washing, wearing masks, consuming plenty of fluids and being younger than 30 would protect them was significantly higher than the other groups, the levels of belief in the protection of sunny weather, ventilation measures and those medicines mentioned in the media were found to be lower than the other groups. Students relied more on using gloves than the other groups (Table 6). Healthcare professionals rated their knowledge about the disease and where to apply if they become sick to be higher. In addition, their level of taking precautions, hand-washing, and the worry of becoming sick and seeing themselves at risk were higher than the other groups as well. While the academic group found themselves to be good in terms of exercise and nutrition, the students rated themselves more negatively in terms of sleeping, being able to relax despite the pandemic, and implementing measures for their homes and belongings (Table 6).

DISCUSSION

Knowledge, attitudes and concerns of individuals about this disease affect the implementation of preventive measures. In our study, most of

the participants were women, university graduates, and were living in cities. They considered their level of knowledge about the coronavirus infection, its transmission pathways and the precautions against it to be sufficient in general. When asked to give a score between 1 and 10 regarding the protectiveness of the proposed measures, such as measures related to hand-washing, staying at home, not using public transportation and social distancing, they gave high scores. However, the score of their belief in the protectiveness of wearing a mask was only 5.

Other studies have also shown that individuals have a high level of knowledge regarding coronavirus and its transmission pathways and its related measures.[5,7,15,18,19] In some studies about the SARS epidemic, it was found that individuals achieved high scores in implementing the recommended precautions, their anxiety levels were low, and their risk perceptions varied.[19-21] Similarly, Vartti et al.[14] stated that although Finnish people had a high level of knowledge and worry about SARS, their individual attitudes were insufficient to comply with the measures and their beliefs about the effectiveness of individual measures were low. In relation to the SARS epidemic, Lau et al.[19] also stated that their participants had higher scores on implementations such as wearing masks, frequent hand-washing, disinfection measures at home, using public transportation and not going to public places at the beginning, but the scores of these measures decreased in the second phase of the study. Their results suggest that the participants had the correct information about the ways of transmission, but the decrease in their beliefs about the effectiveness of the practices as time passes may be related to the decrease in panic and anxiety feelings experienced by them.

In this study, it was determined that women had higher scores of beliefs in and implementation of the preventive measures and their levels of concern about contamination were higher than for men. Additionally, they gave lower scores regarding relaxing despite the pandemic than men. The level of education seems to make a difference in transmission prevention perceptions, such as warm weather conditions and the ventilation of the items, for which there is no evidence of being effective in preventing contamination. It was observed that as the education level decreased, the score regarding belief in such ineffective practices increased. Considering themselves to be at risk was lower among university graduates, and the belief that they would recover was higher in this group. Those individuals with higher education might have thought that they have sufficient information and that was enough to keep the disease under control. Although this finding indicates that people who have received university education have an optimistic approach, it is a finding that should be taken into consideration as this type of approach may reduce the level of precautions taken.

The findings of this present study reveal that there is a significant relationship between being a man and believing in measures against COVID-19 and also applying these measures. Zhong et al.[5] and Lau et al.[19] also found that men had lower scores than females in implementing the recommended measures. Previous studies also noted that men would tend to show more risky behaviors than women.[22,23]

In our study, when the individuals were evaluated in terms of where they live, the scores given regarding effective methods did not change according to their place of residence. However, for those living in the village, the score of believing that sunny and warm weather would protect them was higher, and the score of believing in the preventiveness of alcoholic disinfectants was lower. Those people living in cities had higher scores regarding taking preventive measures. Studies in the literature also support our findings about the low level of knowledge of those individuals living in rural areas compared to those living in cities.[5,7] Our findings suggest that people living in cities may be at an advantage in terms of faster and easier access to correct information sources, and this was reflected in their implementation of recommended measures. For this reason, while planning information and training on the coronavirus infection and its preventative measures, it should be aimed at reaching those individuals living in rural areas as well. In the group working from home, belief that they would be protected by not getting on public transportation was higher. In the group commuting to work, the level of implementing preventive measures, the level of adequate hand-washing and the level of exercise were found to be low. Meanwhile, the score of seeing oneself as being at risk, and worrying about themselves and their family was also higher in this same group. Again, in this group, the score for being able to concentrate on issues other than coronavirus was found to be lower than for other individuals. Considering that half of the individuals participating in our study have a job that they regularly commute to, it is possible that they are at high risk in terms of contacting infected individuals and transmitting the virus to those in their environment. In addition, since they were in the work environment on a daily basis, it was possible that their level of implementation of the recommended measures may not be sufficient.

The scores of believing that hand-washing, masks, consuming fluids and being younger would protect them from the coronavirus infection, and their level of knowledge regarding the disease and where to apply if infected, and their implementation levels of precautions such as hand-washing were significantly higher in the health professionals than in the other groups. The students trusted using gloves more than the other groups. This finding supports the idea that healthcare professionals have sufficient knowledge regarding infection control measures, hygiene principles and coronavirus disease knowledge and experience as expected in terms of their professional characteristics. Bhagavathula et al.[17], contrary to the findings of our study, in their study on healthcare professionals, concluded that healthcare workers had insufficient knowledge of COVID-19 and its precautions, but their risk perception was higher. In our study group, the knowledge level in health professionals seemed sufficient, but the level of worrying about their risk of becoming infected and worrying about transmitting the virus to their family members was also higher. Similar to our study, there are studies showing that there is a high concern among health professionals in terms of catching the infection and transmitting it to their close family members.[24,25]

This high concern of healthcare professionals can be attributed to the uncertainties and unknown features related to this new pandemic, which is due to the lack of comprehensive and accurate information.[16] It is important to address this issue by incorporating it into outbreak management strategies, as health professionals' concerns can negatively affect their effectiveness during an outbreak. Making sure that adequate protective measures are taken can give health professionals a sense of personal safety. Good infection control guidelines, equipment and psychological support should be provided; intensive education campaigns and management support should be established to reduce the concerns of healthcare workers during pandemics. In this study, it was found that students evaluated themselves more negatively

regarding sleeping, being able to relax, and implementing measures related to their home and their belongings. Interruptions occurred in their education as students are one of the vulnerable groups during the pandemic. This finding may indicate that they may need more support in terms of maintaining their physical and mental health.

In our study, it was seen that the participants mostly followed internet-based official institutions and scientific publications, social media platforms and the TV news. In addition, the rate of obtaining information from healthcare professionals they know was quite high. The fact that the individuals participating in our study were young or middle-aged explains why technology and media tools usage as news sources was high. McFadden et al.'s[18] findings coincide with the findings of our study. In their study, the participants chose health professionals as the most reliable source of information and social media as the least trusted source of information. In a study on the SARS epidemic, it was concluded that the participants mostly received information from communication tools such as television, newspaper and radio respectively.[19] Vartti et al.[14], in the SARS process, also found that the society trusts doctors more, but used the internet as a source of information. These results show the importance of the correct use of social media and media communication tools such as television and the importance of facilitating access to accurate information in order to inform the public about the disease and its prevention methods. In this process, media tools such as mobile applications and television should be used by policy makers to better inform the public.

The strength of our study lies in its large sample recruited during the early stages of the coronavirus outbreak.

Due to limited access to the internet and online health resources, especially for older adults and people who live in rural areas, there is a greater risk of having poor knowledge, negative attitudes, and inappropriate preventive practices regarding the coronavirus infection.

Study Limitations

This study also had some limitations. First, this study was conducted via the internet. For this reason, we could not reach those people who have no access to the internet. Furthermore, the timing was at the beginning of the pandemic. These issues may limit the generalization of our results.

Conclusion

It was concluded that the participants had sufficient knowledge regarding the coronavirus infection, its transmission pathways and precautions, and they mostly tried to obtain information from social media platforms, official web sites and the TV news. The rates of believing and implementing measures such as social distancing, hand-washing, staying at home, not using public transportation, and using alcohol disinfectants were high. It was found that women, those who live in cities, those who are health professionals, and those who regularly commute to work believe in the recommended measures more, but their levels of anxiety and considering themselves and their environment to be at risk were higher. Despite all these positive results, the rapid spread of the coronavirus infection shows that there is a need for further studies to evaluate what is changing during this pandemic relating to these factors as time passes.

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MAIN POINTS

- Strict infection control measures are the primary intervention to minimize the spread of the virus.
- People mostly used social media platforms, official websites, and the TV news to obtain information regarding COVID-19.
- The most common preventive measures among people included maintaining social distancing, hand-washing, staying at home, avoiding public transport and using disinfectants.
- Women, people living in cities, healthcare workers, and regular commuters believed in the recommended preventive measures for COVID-19 infection more, however, their level of anxiety and seeing themselves and their environment as being at risk were higher.
- Despite the positive attitudes and the knowledge of people, the rapid spread of the coronavirus infection implies that there is a need for further studies to evaluate changes as time passes during this pandemic process.

ETHICS

Ethics Committee Approval: Ethics committee approval was obtained from the Social Sciences Ethics Committee of the Koç University (approval code: 2020.203.IRB3.083) and research permission was obtained from the Ministry of Health (2020-05-25T17_23_48).

Informed Consent: Online written informed consent was obtained from the participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: F.O., Design: F.O., Data Collection and/or Processing: F.O., F.A., Analysis and/or Interpretation: F.O., F.A., Writing: F.O., F.A.

DISCLOSURES

Conflict of Interest: No conflict of interest was declared by the authors.

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