

Perceptions and Attitudes of Mine Workers towards the COVID-19 Pandemic

Maden İşçilerinin Covid-19 Salgınına Yönelik Algı ve Tutumları

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ABSTRACT

This research was carried out to determine the perceptions and attitudes of coal mine workers who were at risk for COVID-19 infection toward the COVID-19 pandemic. A descriptive research design was used. The population of the study included a total of 929 workers in a state-owned coal mining enterprise. No sampling procedure was employed. The study sample consisted of 305 workers who volunteered to participate in the research between February and March 2022. The data of the study were collected using a Descriptive Characteristics Form, the COVID-19 Perception Scale, the Attitudes toward the COVID-19 Vaccine Scale, the COVID-19 Avoidance Attitudes Scale, the Perception of Control of COVID-19 Scale, and the Perception of Causes of COVID-19 Scale. Descriptive statistics were presented using counts and percentages. Mann-Whitney U and Kruskal-Wallis tests, medians, and quartiles were employed to analyze the differences between dependent and independent variables. According to the results of the study, 31.5% of the participants had contracted COVID-19, and 39.7% of them had a family history of COVID-19 infection. Of the workers, 91.8% had been vaccinated against COVID-19. A significant difference was found between participants' attitudes toward the COVID-19 vaccine and their status of having a chronic disease and constant medication use ($X^2=7.575$, $P<0.05$). There was a significant difference between the participants' COVID-19 avoidance attitudes and their education level ($X^2=8.176$, $P<0.05$). Participants' education, presence of a chronic disease, and constant medication use had a positive effect on avoidance of the disease and getting vaccinated.

Keywords: Mine worker, COVID-19, Perception, Attitudes.

ÖZET

Bu araştırma, Covid-19 enfeksiyonu riski taşıyan kömür madeni işçilerinin Covid-19 salgınına yönelik algı ve tutumlarını belirlemek amacıyla yapıldı. Tanımlayıcı türde bir araştırmadır. Araştırmanın evrenini devlete ait bir maden işletmesinde çalışan toplam 929 işçi oluşturmuştur. Herhangi bir örnekleme yöntemi uygulanmamıştır. Araştırmanın örneklemini Şubat-Mart 2022 tarihleri arasında araştırmaya katılmaya gönüllü olan 305 çalışan oluşturmuştur. Araştırmanın verileri Tanımlayıcı Özellikler Formu, COVID-19 Algı Ölçeği, COVID-19 Aşısına Yönelik Tutum Ölçeği, COVID-19 Kaçınma Tutumları Ölçeği, COVID-19'un Kontrol Algısı Ölçeği ve COVID-19'un Sebepleri Algısı Ölçeği kullanılarak toplanmıştır. Verilerin değerlendirilmesinde sayı ve yüzdeler, bağımlı ve bağımsız değişkenler arasındaki farkları analiz etmek için Mann-Whitney U ve Kruskal-Wallis testleri, medyanlar ve çeyrekler kullanıldı. Araştırma sonuçlarına göre katılımcıların % 31,5'inin Covid-19'a yakalandığı, % 39,7'sinin ailesinde Covid-19 enfeksiyonu öyküsü olduğu belirlendi. Çalışanların %91,8'i COVID-19'a karşı aşılanmıştı. Katılımcıların COVID-19 aşısına karşı tutumları ile kronik hastalık sahibi olma ve sürekli ilaç kullanma durumları arasında anlamlı farklılık bulundu ($X^2=7,575$, $P<0,05$). Katılımcıların COVID-19'dan kaçınma tutumları ile eğitim düzeyleri arasında anlamlı fark bulunmuştur ($X^2=8.176$, $P<0.05$). Katılımcıların eğitim durumu, kronik hastalık varlığı ve sürekli ilaç kullanımı hastalıktan korunma ve aşı yaptırmayı olumlu yönde etkilemiştir.

Anahtar Kelimeler: Maden İşçisi , Covid-19, Algı , Tutum.

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I. INTRODUCTION

Coronavirus (COVID-19) is an infectious disease caused by a newly discovered coronavirus. The COVID-19 pandemic has spread rapidly causing a worldwide public health problem and high mortality and morbidity [1]. The high spread rate of COVID-19 has led to the emergence of large numbers of cases and the collapse of health systems in developed countries, leading to an even more alarming crisis in the national health systems of middle- and low-income countries [2,3]. The global COVID-19 pandemic, which has spread rapidly across the world, has caused millions of confirmed cases and deaths (WHO, 2020). According to the data of the World Health Organization (WHO), there were approximately 752,517,552 cases and 6,804,491 deaths in 2022 [4]. Despite the strong public promotion of physical distancing and personal hygiene routines in Turkey and many other countries, many organizations have faced challenges to their physical structure, customary positions, ordinary operating processes, and workforce protection. According to the data of the Ministry of Health, 17,042,722 cases and 101,492 deaths have occurred due to COVID-19 in Turkey [5].

The outbreak of coronavirus, which was declared a pandemic by the World Health Organization, has spread rapidly since its first emergence (March 11, 2020) in Turkey. One of the most significant issues affected by the pandemic was the sustainability of the economy and production [6]. The mining sector is one of the leading sectors that contribute greatly to production and therefore to the economy throughout the world. It is a very worthy sector in terms of its contribution to the economy and employment in a country. According to 2022 data, there are 147,958 mine workers in Turkey [7]. Since occupational lung diseases are common in the city where hard coal is

mined and where this study was conducted, a 15-day travel ban and weekend lockdowns were imposed. According to the report, 463 workers were infected with COVID-19 [8,9].

Since the concept of disease includes both objective and subjective dimensions, people with similar diseases may show different reactions. Indeed, many factors play a decisive role in this reaction. Health problems can be explained in line with people's knowledge, values, beliefs, and attitudes [10]. The concept of the perception of disease, which has gained importance in recent years, is especially important in terms of appropriate practices [2]. Learning people's perceptions and attitudes toward health and disease is important for the planning and implementation of effective interventions to protect and improve health, or to treat people and have them adapt to treatment.

Employees make up a significant part of the population of Turkey, and healthy employees mean a healthy society. One of the environments where employees can be contacted for raising awareness and health promotion and protection activities against COVID-19 is workplaces. Workplaces have many health risks as many people come together within the same environment [11]. In these environments, employees may have undesirable behaviors and habits that will impair their health. Therefore, studies on the protection of workers' health are vital. However, there is limited research drawing attention to this issue. The COVID-19 pandemic adversely affects both individual and social health, impairs the quality of life, and affects employees' health seriously. Inaccurate information can lead to incorrect behaviors [2].

II. METHOD

Type of the research

A descriptive research design was used.

Population and sample of the research: The population of the research consisted of a total of 929 workers working in a state-owned coal mining enterprise, including 786 working underground and 143 aboveground. No sampling method was implemented; 305 workers who volunteered to participate in the study between February and March 2022 were included instead.

Research questions

What are workers' attitudes toward the COVID-19 vaccine?

What are workers' COVID-19 avoidance attitudes?

What are workers' disease attitudes toward the COVID-19 pandemic?

How do workers perceive the control of the COVID-19 pandemic?

How do workers perceive the causes of the COVID-19 pandemic?

Is there a relationship between the general sociodemographic characteristics of workers and their perceptions of and attitudes toward the COVID-19 pandemic?

Variables of the research

Dependent variables: Perceptions and attitudes toward the COVID-19 pandemic

Independent variables: Participants' age, marital status, education level, total work experience as a mine worker, number of children, and status of having had diseases and accidents.

Inclusion Criteria: Literacy, voluntary participation in the research, and working in the coal mining enterprise where the research was conducted

Exclusion criteria: Delivery of the questionnaire incomplete

Data collection methods and tools: First, participants were informed about the study and data collection tools and then the tools were distributed to them. During data collection, the workers were taken to a separate, quiet room for their privacy. Their written and verbal consent was obtained after necessary explanations. The study data were collected using a Descriptive Characteristics Form, the COVID-19 Perception Scale, the Attitudes toward the COVID-19 Vaccine Scale, the COVID-19 Avoidance Attitudes Scale, the Perception of Control of COVID-19 Scale, and the Perception of Causes of COVID-19 Scale. Necessary permission was obtained from the owners of the scales to be used in the study [12].

Data analysis: Data analysis was conducted on IBM SPSS 21.0 software package. Counts and percentages were used for descriptive data. Since the data did not have a homogeneous distribution, non-parametric analysis methods were employed. Mann-Whitney U and Kruskal-Wallis tests, medians, and quartiles were used to analyze differences between dependent and independent variables. The significance level was taken as $p < 0.05$.

Ethics of the research: Before the research was initiated, approval of the Ethics Committee of the Faculty of Health Sciences of Marmara University (25.11.2021/100) was obtained. The mine workers were informed about the research and their verbal consent showing their voluntary participation in the research was obtained.

Limitations of the study: Data were collected based on mine workers' self-reports. The results of this study are limited to the workers working in the mine where this research was conducted. It cannot be generalized to all mine workers in Turkey. It should also be noted that the

results of the study rely on the memory and honesty of the participants.

III. RESULTS

Of the mine workers, 50.2% were high school graduates, 20.7% were university graduates, 80% were married, 73.8% had children, 33.8% had been working in this mine for 11-15 years, and 39.7% worked as panel operators. According to the findings, 31.5% of the workers had been infected with COVID-19, 39.7% had a family member who had contracted COVID-19, and 91.8% had received the COVID-19 vaccine (Table 1).

Table 1: Socio-demographic Characteristics of Participants

	Count (n)	Percentage (%)
Elementary school	32	10.5
Middle school	57	18.7
High school	153	50.2
Üniversity	63	20.7
Married	244	80
Single	61	20
Elementary school	81	32.9
Middle school	64	26.1
High school	65	26.4
Üniversity	36	14.6
None	80	26.2
1-2	144	47.2
3-4	78	25.6
≥5	3	1.0
1-5	60	19.7
6-10	51	16.7
11-15	103	33.8
16-20	58	19.0
21-25	24	7.9
≥26	9	3.0
Panel	121	39.7
Preparatory	55	18.0
Transportation	41	13.4
Occupational health and safety	23	7.5
Engineer	42	13.8
Office	6	2.0
Supervisor	10	3.3
Safety	3	1.0
Student	4	1.3

There was a significant difference between the participants' positive attitudes toward the COVID-19 vaccine and the presence of chronic disease (diabetes, hypertension, or pneumoconiosis) ($X^2=7.575$ $P<0.05$) and constant medication use for these diseases ($U=-2.253$, $P<0.05$) (Table 2)

Table 2: Comparison of some variables and the positive attitude sub-dimension of the attitudes toward the COVID-19 Vaccine Scale

	Count (n)	Percentage (%)
Elementary school	32	10.5
Middle school	57	18.7
High school	153	50.2
Üniversity	63	20.7
Married	244	80
Single	61	20
Elementary school	81	32.9
Middle school	64	26.1
High school	65	26.4
Üniversity	36	14.6
None	80	26.2
1-2	144	47.2
3-4	78	25.6
≥5	3	1.0
1-5	60	19.7
6-10	51	16.7
11-15	103	33.8
16-20	58	19.0
21-25	24	7.9
≥26	9	3.0
Panel	121	39.7
Preparatory	55	18.0
Transportation	41	13.4
Occupational health and safety	23	7.5
Engineer	42	13.8
Office	6	2.0
Supervisor	10	3.3
Safety	3	1.0
Student	4	1.3

	n	%	Median and quartiles	Test
Marital status				
Single	61	20	3.75(2.62-4.12)	U=-1.669 p>0.05
Married	244	80	4.00(3.00-5.00)	
Level of education				
Elementary school	81	32.9	3.75(2.50-5.00)	X ² =7.419 p>0.05
Middle school	64	26.1	4.00(3.25-5.00)	
High school	65	26.4	4.00(2.75-4.50)	
University	36	14.6	4.00(3.00-4.75)	
Number of children				
None	80	26.2	3.75(2.50-4.00)	X ² =2.783 P>0.05
1-2	144	47.2	4.00(3.00-4.75)	
3-4	78	25.6	4.00(3.00-5.00)	
≥5	3	1.0	4.00(2.50-)	
Total work experience as a mine worker (year)				
1-5	60	19.7	3.50(2.50-4.18)	X ² =4.696 P>0.05
6-10	51	16.7	4.00(3.00-4.50)	
11-15	103	33.8	4.00(3.00-5.00)	
16-20	58	19.0	3.75(2.68-4.31)	
21-25	24	7.9	3.87(2.31-5.00)	
≥26	9	3.0	4.00(2.62-4.87)	
Branch of work				
Panel	121	39.7	3.75(2.87-4.62)	X ² =3.551 P>0.05
Preparatory	55	18.0	4.00(3.00-5.00)	
Transportation	41	13.4	4.00(3.37-5.00)	
Occupational health and safety	23	7.5	3.50(2.50-4.25)	
Engineer	42	13.8	4.00(3.00-4.56)	
Office	6	2.0	4.12(3.56-4.81)	
Supervisor	10	3.3	2.62(2.18-5.00)	
Safety	3	1.0	4.00(2.75-)	
Student	4	1.3	3.75(2.56-4.00)	
Status of experiencing a health problem in the past week				
Yes	21	6.9	3.75(2.50-5.00)	U=-.928 p>0.05
No	284	93.1	4.00(3.00-4.75)	
The health problem (if yes)				
COVID-19	2	9.5	3.00(2.00-)	X ² =0.454 p>0.05
Flu	5	23.8	5.00(3.75-5.00)	
Pain	14	66.7	3.25(2.50-4.12)	
Presence of chronic disease				
Yes	10	3.3	4.37(1.25-5.00)	U=-1.558 p>0.05
No	295	96.7	4.00(3.00-4.75)	
Chronic disease (if yes)				
Diabetes	2	22.2	4.50(4.00-)	X ² =7.575 P<0.05
Hypertension	1	11.1	1.25(1.25-1.25)	
Pneumoconiosis	6	66.7	4.87(3.06-5.00)	
Constant medication use				
Yes	11	3.66	4.00(1.25-5.00)	U=-2.253 P<0.05
No	294	96.4	4.00(2.93-4.75)	
Status of having had an occupational accident				
Yes	54	17.7	3.50(2.50-4.31)	U=-.983 P>0.05
No	251	82.3	4.00(3.00-5.00)	
Status of having had occupational diseases				
Yes	6	1.7	4.75(4.12-5.00)	U=.000 P>0.05

No	299	98.3	4.00(2.75-4.75)	
Status of having had COVID-19				
Yes	96	31.5	3.75(2.50-4.25)	U=-1.581 P>0.05
No	209	68.5	4.00(3.00-5.00)	
Family history of COVID-19				
Yes	121	39.7	3.75(2.62-4.50)	U=-.817 P>0.05
No	184	60.3	4.00(3.00-5.00)	
Status of having received the COVID-19 vaccine				
Yes	280	91.8	4.00(3.00-4.75)	U=-1.760 P>0.05
No	25	8.2	2.12(2.00-4.00)	
Status of using methods of protection against COVID-19				
Hand washing				
Yes	261	85.6	4.00(3.00-5.00)	U=-.928 p>0.05
No	44	14.4	3.75(2.50-4.00)	
Wearing a mask				
Yes	260	85.2	4.00(3.00-5.00)	U=-.928 P>0.05
No	44	14.8	3.25(2.50-4.00)	
Social distancing				
Yes	193	63.3	4.00(3.00-5.00)	U=-.568 P>0.05
No	112	36.7	4.00(2.75-4.50)	
Getting vaccinated				
Yes	263	86.2	4.00(3.00-5.00)	U=-1.163 P>0.05
No	42	13.8	3.50(2.25-4.00)	
Frequent ventilation of the room				
Yes	203	66.6		
No	102	33.4		

Regarding the comparison of participants' sociodemographic characteristics and the results, there was a significant difference between cognitive avoidance of COVID-19 and education level ($\chi^2=8.174$, $p<0.05$). Also, a significant

difference was found between the methods of protection against COVID-19 cognitively and wearing masks ($U=2.299$; $P<0.05$), social distancing ($U=2.352$; $P<0.05$), and hand hygiene ($U=2.004$; $P<0.05$) (Table 3).

Table 3: Comparison of some variables and the cognitive avoidance sub-dimension of the COVID-19 Avoidance Attitudes

	n	%	Median and quartiles	Test
Marital status				
Single	61	20	2.00(1.70-2.90)	U=-.024 P<0.05
Married	244	80	2.00(1.60-2.60)	
Level of education				
Elementary school	81	32.9	2.00(1.20-2.40)	$\chi^2=8.174$ $p<0.05$
Middle school	64	26.1	2.00(1.80-2.30)	
High school	65	26.4	2.00(1.60-2.90)	
University	36	14.6	2.00(1.15-2.60)	
Number of children				
None	80	26.2	2.00(1.80-2.80)	$\chi^2=7.585$ P>0.05
1-2	144	47.2	2.00(1.40-2.80)	
3-4	78	25.6	2.00(1.60-2.00)	
≥5	3	1.0	2.00(1.00-)	

Total work experience as a mine worker (year)				
1-5	60	19.7	2.00(1.60-2.80)	X ² =6.736 P>0.05
6-10	51	16.7	2.00(1.80-3.40)	
11-15	103	33.8	2.00(1.40-2.60)	
16-20	58	19.0	2.00(1.80-2.25)	
21-25	24	7.9	2.00(1.00-2.70)	
≥26	9	3.0	2.00(1.00-2.40)	
Branch of work				
Panel	121	39.7	2.00(1.602.80)	X ² =3.855 P>0.05
Preparatory	55	18.0	2.00(1.40-2.40)	
Transportation	41	13.4	2.00(1.00-2.00)	
Occupational health and safety	23	7.5	2.20(1.60-3.20)	
Engineer	42	13.8	2.00(1.80-2.85)	
Office	6	2.0	2.00(1.90-3.30)	
Supervisor	10	3.3	2.00(0.45-3.30)	
Safety	3	1.0	1.60(1.00-)	
Student	4	1.3	1.80(0.40-2.60)	
Status of experiencing a health problem in the past week				
Yes	21	6.9	2.00(1.80-2.40)	U=-1.828 p>0.05
No	284	93.1	2.00(1.60-2.80)	
The health problem (if yes)				
COVID-19	2	9.5	3.00(2.00-)	X ² =.133 P>0.05
Flu	5	23.8	2.00(1.80-2.20)	
Pain	14	66.7	2.00(1.80-2.55)	
Presence of chronic disease				
Yes	10	3.3	1.20(1.00-2.00)	U=-1.729 p>0.05
No	295	96.7	2.00(1.60-2.80)	
Chronic disease (if yes)				
Diabetes	2	22.2	0.50(0.00-)	X ² =3.835 p>0.05
Hypertension	1	11.1	2.00(2.00-2.00)	
Pneumoconiosis	6	66.7	1.20(1.00-2.00)	
Constant medication use				
Yes	11	3.66	1.80(1.00-2.00)	U=-1.199 p>0.05
No	294	96.4	2.00(1.60-2.80)	
Status of having had an occupational accident				
Yes	54	17.7	2.00(1.20-2.40)	U=-1.248 P>0.05
No	251	82.3	2.00(1.80-2.80)	
Status of having had occupational diseases				
Yes	6	1.7	1.00(1.00-2.00)	U=-1.594 P>0.05
No	299	98.3	2.00(1.60-2.80)	
Status of having had COVID-19				
Yes	96	31.5	2.00(1.65-3.00)	U=-.341 P>0.05
No	209	68.5	2.00(1.50-2.60)	
Family history of COVID-19				
Yes	121	39.7	2.00(1.50-2.80)	U=-1.349 P>0.05
No	184	60.3	2.00(1.65-2.60)	
Status of having received the COVID-19 vaccine				
Yes	280	91.8	2.00(1.60-2.60)	U=-1.699 P>0.05
No	25	8.2	3.30(1.75-4.00)	

When the participants were compared according to the attitudes toward the environment sub-dimension of the Perception of Causes of COVID-19 Scale, there was a difference between the presence of chronic disease (U=-2.883, P<0.05), constant medication use (U=-2.324, P<0.05), and status of having occupational diseases (U=-2.646, P<0.05) and total work experience as a mine worker (x²=11.804, P<0.05) (Table: 4).

Table 4: Comparison Comparison of some Variables and the Attitude Toward the Environment Sub-dimension of the Perception of causes of COVID-19 Scale

Marital status	n	%	Median and quartiles	Test
Single	61	20	2.80(2.00-3.20)	U=-1.134 p>0.05
Married	244	80	2.40(2.00-3.20)	
Level of education				
Elementary school	81	32.9	2.00(1.80-3.35)	x ² =1.500 p>0.05
Middle school	64	26.1	2.40(2.00-3.00)	
High school	65	26.4	2.60(2.00-3.20)	
University	36	14.6	2.60(2.00-3.40)	
Number of children				
None	80	26.2	2.90(2.00-3.40)	X ² =6.768 P>0.05
1-2	144	47.2	2.40(2.00-3.20)	
3-4	78	25.6	2.30(2.00-3.00)	
≥5	3	1.0	2.60(2.20-)	
Total work experience as a mine worker (year)				
1-5	60	19.7	2.70(2.00-3.20)	X ² =11.804 P<0.05
6-10	51	16.7	3.00(2.00-3.80)	
11-15	103	33.8	2.20(2.00-3.00)	
16-20	58	19.0	2.40(2.00-3.20)	
21-25	24	7.9	3.00(1.80-3.40)	
≥26	9	3.0	2.00(1.40-3.30)	
Branch of work				
Panel	121	39.7	2.40(2.00-3.20)	X ² =2.104 P>0.05
Preparatory	55	18.0	2.40(2.00-3.00)	
Transportation	41	13.4	2.80(2.00-4.20)	
Occupational health and safety	23	7.5	2.80(2.00-3.40)	
Engineer	42	13.8	2.60(2.00-3.00)	
Office	6	2.0	2.80(1.70-3.75)	
Supervisor	10	3.3	2.90(0.90-3.25)	
Safety	3	1.0	2.40(1.60-)	
Student	4	1.3	2.70(0.60-3.00)	
Status of experiencing a health problem in the past week				
Yes	21	6.9	2.40(2.00-3.30)	U=-.775 p>0.05
No	284	93.1	2.40(2.00-3.20)	
The health problem (if yes)				
COVID-19	2	9.5	2.50(2.00-)	X ² =-.774 p>0.05
Flu	5	23.8	2.00(1.80-3.70)	
Pain	14	66.7	2.50(2.20-3.25)	
Presence of chronic disease				
Yes	10	3.3	2.90(1.75-3.25)	U=-2.883 P<0.05

Also, there was a significant difference between participants' social distancing behaviors (U= 2.266, P<0.05) and their education level ($\chi^2=13.143$, P<0.05) and number of children ($\chi^2=7.840$, P<0.05) (Table 5).

Table 5: Comparison of some Variables and the Faith Sub-dimension of the Perception of Causes of COVID-19 Scale

	n	%	Median and quartiles	Test
Marital status				
Single	61	20	2.66(1.66-3.33)	U=-1.282 p>0.05
Married	244	80	2.33(1.33-3.00)	
Level of education				
Elementary school	81	32.9	2.00(1.00-2.91)	$\chi^2=13.143$ p<0.05
Middle school	64	26.1	3.00(2.00-3.83)	
High school	65	26.4	3.00(1.83-3.33)	
University	36	14.6	2.00(1.00-3.00)	
Number of children				
None	80	26.2	2.33 (1.33-3.00)	$\chi^2=7.840$ P<0.05
1-2	144	47.2	2.66 (1.33-3.33)	
3-4	78	25.6	2.66 (2.00-3.66)	
≥5	3	1.0	3.00 (2.33-)	
Total work experience as a mine worker (year)				
1-5	60	19.7	2.33(1.66-3.00)	$\chi^2=2.635$ P>0.05
6-10	51	16.7	2.33(1.00-3.00)	
11-15	103	33.8	2.66(1.66-3.33)	
16-20	58	19.0	3.00(2.00-3.33)	
21-25	24	7.9	2.83(1.66-3.25)	
≥26	9	3.0	2.00(1.00-2.50)	
Branch of work				
Panel	121	39.7	2.66(1.66-3.33)	$\chi^2=8.356$ P>0.05
Preparatory	55	18.0	2.66(1.33-3.66)	
Transportation	41	13.4	3.00(2.00-3.66)	
Occupational health and safety	23	7.5	2.00(1.00-2.66)	
Engineer	42	13.8	2.83(1.58-3.33)	
Office	6	2.0	1.50(1.00-3.08)	
Supervisor	10	3.3	3.00(0.75-3.08)	
Safety	3	1.0	1.66(1.66-1.66)	
Student	4	1.3	2.16(0.41-2.91)	
Status of experiencing a health problem in the past week				
Yes	21	6.9	2.33(1.16-3.16)	U=-.425 p>0.05
No	284	93.1	2.66(1.66-3.33)	
The health problem (if yes)				
COVID-19	2	9.5	1.66(1.00)	$\chi^2=2.779$ p>0.05
Flu	5	23.8	4.00(2.33-4.00)	
Pain	14	66.7	2.16(1.00-2.75)	
Presence of chronic disease				
Yes	10	3.3	2.33(1.50-3.16)	U=-.605 p>0.05
No	295	96.7	2.66(1.66-3.33)	
Chronic disease (if yes)				
Diabetes	2	22.2	1.66(1.00-)	$\chi^2=.093$ p>0.05
Hypertension	1	11.1	3.00(3.00-3.00)	
Pneumoconiosis	6	66.7	2.16(1.50-3.16)	
Constant medication use				
Yes	11	3.66	2.00(1.00-2.66)	U=-1.187 p>0.05
No	294	96.4	2.66(1.66-3.33)	
Status of having had an occupational accident				
Yes	54	17.7	2.66(1.00-3.00)	U=-.899 P>0.05
No	251	82.3	2.66(1.66-3.33)	

Status of having had occupational diseases				
Yes	6	1.7	3.00(1.33-3.33)	U=-1.012 P>0.05
No	299	98.3	2.66(1.66-3.33)	
Status of having had COVID-19				
Yes	96	31.5	2.50(2.00-3.00)	U=-1.760 P>0.05
No	209	68.5	2.66(1.33-3.33)	
Family history of COVID-19				
Yes	121	39.7	2.00(1.66-3.00)	U=-1.407 P>0.05
No	184	60.3	3.00(1.66-3.58)	
Status of having received the COVID-19 vaccine				
Yes	280	91.8	2.66(1.66-3.33)	U=-.442 P>0.05
No	25	8.2	2.83(2.25-4.00)	
Status of using methods of protection against COVID-19				
Hand washing				
Yes	261	85.6	2.66(1.66-3.33)	U=-.663 p>0.05
No	44	14.4	2.66(1.08-3.33)	
Wearing a mask				
Yes	260	85.2	2.66(1.66-3.33)	U=-.709 P>0.05
No	44	14.8	2.66(1.16-3.33)	
Social distancing				
Yes	193	63.3	2.66(1.66-3.50)	U=-2.266 P<0.05
No	112	36.7	2.33(1.00-3.00)	
Getting vaccinated				
Yes	263	86.2	2.66(1.66-3.33)	U=-.360 P>0.05
No	42	13.8	2.66(2.00-3.33)	
Frequent ventilation of the room				
Yes	203	66.6	2.66(1.66-3.33)	U=-1.409 P>0.05
No	102	33.4	2.33(1.00-3.00)	
Following quarantine rules				
Yes	211	69.2	2.66(1.66-3.33)	U=-.088 P>0.05
No	94	30.8	2.33(1.00-3.33)	
Status of using personal protective equipment				
Yes	296	97	2.66(1.66-3.33)	U=-1.042 P>0.05
No	9	3	2.00(1.00-2.83)	

IV. DISCUSSION

Beyond being an infectious and serious disease, COVID-19 has been perceived as an illness that arouses panic and anxiety in society due to uncertainties and fear of death [13]. Prevention and promotion in public health rely heavily on knowledge, attitudes, and perceptions. It also includes various perspectives on the etiology and aggravating factors of the disease, recognition of symptoms, available therapeutic options, and potential outcomes. Information about COVID-19 is collected from a variety of sources, including related viral diseases, official data, social media, the Internet, previous personal experiences, and medical sources. The authenticity of these data may affect various preventive behaviors and differ across society [14].

Therefore, it may be necessary to learn about the psychological adjustment and resilience of workers during pandemics, as well as their attitudes toward vaccines, fear, and anxiety. In this context, occupational health nurses need to understand the changes that occur in the lives of mine workers, who have an important place in working life, determine their attitudes toward the disease, and plan health services to be given to them [15]. Due to their design, mining workplaces prevent social distance, there is no or limited personal protective equipment (PPE), and sanitation and ventilation are inadequate. It is known that the ventilation systems of underground mining enterprises in Turkey are not good. In addition, it is thought that heat, humidity, dust, and air in the working environment circu-

late the entire mine underground, which may pave the way for the spread of the pandemic. Mine workers usually go to work by crowded public transport or semi-private transport [16].

One-third of the participants in this study had contracted COVID-19. Also, the families of more than a third of the participants had been infected with COVID-19. It was observed that the presence of someone in the family who had contracted COVID-19 had a significant correlation with the rate of workers who had contracted COVID-19. In addition, it is thought that workers who had caught COVID-19 may have transmitted it to their families. Those who worked unprotected are thought to have carried the virus from work to their homes and communities inevitably, increasing the spread of infection.

When the sociodemographic characteristics of the participants and their cognitive COVID-19 avoidance attitudes were compared, it was seen that the education level of the participants was effective. The spread of the COVID-19 virus between individuals via droplets and the respiratory tract shows how tragic the extent of the problem is [17]. Undoubtedly, the best way to prevent and slow down the spread of COVID-19 among people is to know about the disease and its spread, as well as following protection rules, such as washing hands frequently, rubbing hands with alcohol-based solution, not touching the face, social distancing, and wearing a mask [18]. In this study, it was found that the most frequently followed prevention measures were hand washing and getting vaccinated as a method of protection against COVID-19. However, it was observed that the participants did not comply with social distancing and frequent room ventilation rules as desired (Table 3). Indeed, it is suggested in the literature that this disease is transmitted via droplets, and therefore a distance of at least one meter should be maintained and closed areas sho-

uld frequently be ventilated [18,19]. In Turkey, the regulations governing the prevention of contamination in the mining industry and maintaining, monitoring, and managing healthcare services are specified in the guidelines of the Ministry of Health. Accordingly, first, half of the workers in the mine were sent on leave on a shift work basis and the number of workers was reduced. Therefore, contact was reduced in the shuttles and workplace. Care was taken to have them work at a necessary distance and have fewer people working at the same time. The General Directorate of Occupational Health and Safety in Turkey has prepared a checklist to protect mine workers from the new type of coronavirus pandemic. This checklist consisted of 40 items. It covers many issues, such as the capacity of shuttles, hygiene, and personal protective equipment to be used in shuttles, disinfection of the changing rooms, dining hall, and rest areas, informing the employees, and measures to be taken [20]. However, mine workers have a variety of individual characteristics and diverse potentials stemming from age and health status and as they make up the population of productive age. They may also have accompanying occupational and chronic diseases. In this study, two miners had diabetes, six had pneumoconiosis, and one had hypertension. Participants who had chronic diseases, used medication constantly, and had an occupational disease found the COVID-19 disease more dangerous (Table 4). It has been reported that the disease can turn into pneumonia and therefore artificial respiration methods are needed [18]. For this reason, workers who had both pneumoconiosis and other chronic diseases and also had a high probability of being exposed to respiratory system diseases thought that having experienced COVID-19 would adversely affect their health. This situation may increase the psychological burden of workers with chronic diseases due to fear of death, illness, or complications [20].

In a study conducted in the United States, 50% of miners were found to have very high fears and concerns about the pandemic [21]. In addition, participants may encounter other medical issues that will increase their risk of contracting COVID-19 or developing dangerous health complications. In this study, it was found that the education levels of the participants were effective in their use of methods for protection against COVID-19 and cognitive avoidance attitudes. Hanawi et al. (2020) found that individuals with a high level of education were more likely to comply with protection measures [22]. For this reason, it is thought that health education may be the primary strategy needed to increase the COVID-19 knowledge of participants with lower education levels and to ensure their protection. Health literacy has emerged as one of the strongest psychosocial determinants of health over the past 30 years and has also accounted for a range of health inequalities by age, education, and socioeconomic status [23]. For this reason, practices to increase health literacy in the workplace are required.

Participants thought that they often contracted the COVID-19 disease through contact and at the workplace. This is because it is thought that working, eating, and bathing in the same environment in the workplace increase the spread of the virus. These findings can be attributed to the risk of COVID-19 complications and the increasing mortality rate for those with a history of the disease. Strategies such as providing information on preventing transmission of the disease in workers infected or suspected to have contracted COVID-19, creating appropriate supportive environments, and providing appropriate protective equipment seem vital.

The limited physical distance between workers in mines and high worker mobility increases the risk of transmission compared to the general population. In this study, partici-

pants stated that they could not keep the necessary distance. There are no studies conducted on the risk of contamination among miners in Turkey. In addition, mine workers may constantly experience potential anxiety and fear. This is due to the fear of transmitting the disease to a family member. Occupational health nurses' health promotion programs should be prioritized by strengthening health education programs and expanding knowledge [24]. Efforts to combat the pandemic necessitate treatment and vaccination studies as well as restrictions and compliance with the rules. In this context, international efforts to eradicate the virus have gained momentum since the first emergence of the disease, and vaccination programs have begun to be implemented today. The perception of society about COVID-19 disease is extremely vital in the implementation of preventive measures, but vaccines are considered one of the most powerful tools in the fight against infectious diseases (CDC). The high vaccine acceptance rate (91.8%) among the participants in this study showed a definite disposition toward the vaccine as a prevention strategy (Table 1). We can foresee that although participants had knowledge about the COVID-19 pandemic, they might have concerns about the adverse effects of vaccination and other new treatments. For example, a study on workers in the United States indicated that one-third (33%) of respondents believed in one or more conspiracies about COVID-19. [25]. It was reported that participants who believed in conspiracies had 3.9 times lower vaccination activity. These participants gave less support to public health practices [26]. In this study, only 5.5% of the participants believed in conspiracy theories. Our findings were practical in explaining participants' propensity to getting vaccinated. Therefore, focusing on positive messages that highlight the social effects of vaccination is a significant strategy. This can be applied to help design workplace vac-

ination programs for frontline workers during the pandemic. It is thought that this situation will be useful to reduce participants' perception of the disease and the risk of contracting the disease and develop risk-reducing healthy behaviors.

Participants with ten above years of work experience and those with children found the threat of the COVID-19 pandemic more serious. This showed that participants who did not have children or had less work experience were less anxious. Some studies have shown that educated and young people are more positive about the disease [27,28]. However, according to our findings, the lack of awareness and enough information about the disease in young people and those who did not have children led to undesirable attitudes and practices, which may ultimately have negative consequences for infection control. For many people with low health literacy, the perception of personal risk and the ability to prevent infection may be limited. This may be because individuals feel that they are less likely to change their social status, or because there is a lack of public health communication that provides clear, effective messages about actionable and recommended protective behaviors.

V. CONCLUSIONS

In conclusion, we determined the perceptions, attitudes, and behaviors of mine workers working underground during the COVID-19 pandemic in this study. As participants' education level increased, their methods of protection against COVID-19 increased, as well. Total work experience as a mine worker, having a chronic disease, constant use of medication, and having an occupational disease had a positive effect on participants' perceptions of the causes of the disease. Educational status of the participants and having children affected their correct perception

of the causes of the disease.

The social and psychological impacts of possible pandemics in the medium/long term can be large, and workplaces may have to face this in the future. The pandemic may be over now, but occupational health nurses can raise awareness about the impact of this pandemic on workers' health. Occupational health nurses are recommended to carry out practices to prevent possible health risks for participants who have a low level of education and total work experience of fewer than 10 years, and do not have a child, to develop guidelines accordingly, and to share them with employees. This study should be considered preliminary research and its results can be used to focus on education about effective risk management and pandemic control.

In Turkey, mine workers work in narrow spaces and they share various complexes, such as administrative buildings, offices, dining halls, dormitories, common areas (toilets, bathrooms, etc.), and stock areas, which can pose a risk in terms of the infectiousness of the virus. For this reason, determining the perceptions and attitudes of mine workers toward the COVID-19 pandemic and its vaccine and the factors associated with them in the fight against the pandemic is undoubtedly a significant step in preparing for future pandemics. In line with this information, the occupational health nurse can guide the design of education programs planned to provide healthy lifestyle behaviors to prevent this disease in the workplace in the future and to create environmental conditions that will improve health in the workplace. Therefore, this can contribute to carrying out interventions to emphasize the significance of being healthy for mine workers.

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Study design: NK,BT,

Data collection: BT,

Data analysis: NK, BT,

Study supervision: NK, BT,

Manuscript writing: NK, BT.

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