



ORIGINAL ARTICLE

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Assessment of knowledge and anxiety level of forensic science experts and technicians on SARS-CoV2 Pandemic

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Abstract

This prospective, descriptive and cross-sectional study was performed to assess the knowledge and anxiety levels of forensic science experts and technicians working at the Ministry of Justice Council of Forensic Medicine regarding the Severe Acute Respiratory Syndrome – Corona Virus2 (SARS-CoV2) pandemic. Research data was obtained by a questionnaire, including personal information questions, a Coronavirus 19 Phobia (C19P-S) scale, and knowledge level questions, conducted on 295 participants between 01/10/2020–30/11/2020. Knowledge scores of the participants having bachelor's degrees (16.57 ± 7.51) were found to be lower than those of the associate degree (23.74 ± 6.52) and postgraduate degree (23.29 ± 6.63) groups. The professional group with the lowest knowledge score was the engineer (12.00 ± 4.95). The knowledge score of forensic medicine specialists (24.78 ± 5.98), forensic medicine residents (24.78 ± 5.53), and technicians (23.84 ± 6.61) were higher than other professional groups. The psychological sub-dimension score was 18.69 ± 5.73 , while psychosomatic 8.93 ± 3.72 , social 14.65 ± 4.47 , economic 8.54 ± 3.39 , and the total C19P-S scale was 50.80 ± 14.56 . The psychological and total C19P-S scale scores of the female participants were higher than the scores of the men. Total C19P-S scores of the participants working in the specialized departments were higher than the participants working on the specialized boards. The highest C19P-S scale total score was determined in the technician's group. In general, the knowledge and anxiety levels were determined as "moderate". The findings of this study indicate that, in addition to the stress of working with a high risk of transmission, also postponed schedules, accumulated workload, etc. may affect the psychological state of forensic science experts and technicians. However, the coping rates are strong enough to keep the stress level at "moderate". Moderate level knowledge scores may reveal the need to do more reading on health topics and perform more studies on SARS-CoV2 while it may also be seen due to the significant information pollution.

Keywords: SARS-CoV2, pandemic, stress, knowledge, forensic, questionnaire

Introduction

SARS-CoV2 was first detected in Wuhan, one of China's major commercial centers. In December 2019, the disease was determined to be contagious, and it became the focus of global attention due to its rapid spread to all continents and societies. On March 11th, 2020, it was announced that the disease had spread across the world by the report of the World Health Organization and was recognized as a pandemic [1,2].

Since the day of its appearance, SARS-CoV2 has paved the way for many psychological problems of humanity that are unsafe and life-threatening. Anxiety, phobias or stress, tachycardia, hypertension,

insomnia, and chest tightness caused by the SARS-CoV2 pandemic can negatively affect the quality of life of individuals. It has been shown that the continuation of this process can lead to various psychiatric, endocrine, and cardiac diseases [3-5].

Uncertainty about the future during the pandemic can exacerbate fears and anxieties about one's health and the condition of loved ones. Even after the pandemic ends, deterioration in mental health (stress, pessimism, mood disorders, post-traumatic stress disorder, sleep disorders, obsessive-compulsive disorder, low self-esteem, depression or other anxiety disorders, etc.) is likely to persist for a long time among those actively working in the field and those who are unaccompanied. In addition, the highest risk group for the SARS-CoV2 pandemic is health care professionals who come into contact with infected patients. The risk of infection in a stressful work environment and the thought of spreading the virus to their families, friends, or colleagues place psychological pressure on health care professionals [4,6-11].

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All workers who work face-to-face and have contact during the epidemic are at-risk groups in terms of pandemic infection. Concerns about infection and transmission that have developed because of the risk of contamination in the face-to-face working environment, long hours and intensive work, and inadequate personal protective equipment (PPE) support have especially worn active health care professionals down physically and psychologically during the pandemic [12,13]. Health care professionals who come into contact with infected persons, perform aerosol-generating procedures (intubation, tracheostomy, etc.), collect and transport culture specimens, and perform autopsy procedures of infected persons are defined as "high" or "very high" professional risk groups, especially in the risk classification for SARS-CoV2 exposure [11]. In our country, although there are studies from different fields that include knowledge about SARS-CoV2 and measurements of anxiety it causes, the study by Ersoy et al., in which the changes in the forensic examination and autopsy workload of forensic medicine physicians, the physical conditions and material requirements that increase the risk of infection and possible action plans for out-of-field assignments related to the SARS-CoV2 pandemic have been examined, is noteworthy in the forensic sciences field. In this study, with its complementary parameters to the 'external conditions'-study of Ersoy et al. mentioned above, it had been deemed appropriate to examine the knowledge level of forensic science experts and technicians about SARS-CoV2 practice and the psychological consequences of SARS-CoV2 pandemic to build an 'internal results'-study of SARS-CoV2 [13].

During this difficult SARS-CoV2 pandemic period, as one of the Turkey National Disaster Response Plan stakeholders, the Council of Forensic Medicine is fulfilling its responsibilities in the fields of biosafety and expert witness. As the Council of Forensic Medicine maintains its importance in the global and regional possible future scenarios, the effective work of the experts and technicians occupies an important place in the successful fulfillment of these responsibilities of the Council of Forensic Medicine. The effective contribution degree of the experts in the Council of Forensic Medicine in the SARS-CoV2 pandemic can be determined by a joint assessment of their anxiety levels as well as their knowledge levels about the pandemic. This study aimed to assess the knowledge and anxiety levels of experts and technicians at the Council of Forensic Medicine about the SARS-CoV2 pandemic using a questionnaire.

Materials and Methods

This study was conducted between 01/10/2020 and 30/11/2020 to assess the knowledge and anxiety levels of experts and technicians working in the field of forensic sciences at the Presidency of the Council of Forensic Medicine (as the central unit) about the SARS-CoV2 pandemic as a prospective, descriptive and cross-sectional study.

The study universe consisted of a total of 571 forensic sciences personnel, including 122 forensic medicine specialists, 123 forensic medicine residents, 74 technicians, 75 other specialist physicians, 88 engineers, and 89 other experts. Accordingly, the minimum sample size required for the significance of the study was calculated as 230 subjects.

For collecting the data, the Council of Forensic Medicine Personnel Questionnaire Form (Appendix A) was used, which consists of three parts. In the first part of the questionnaire, personal information was obtained; in the second part, the 'Coronavirus 19 Phobia (C19P-S) Scale' developed by Arpacı et al. [14] in 2020 with Cronbach $\alpha=0.92$, and in the third part, the "Measurement of Knowledge and Awareness of Forensic Science Experts and Technicians in the SARS-CoV2 Pandemic Period Form" was included. In that form, the general contagion characteristics in the SARS-CoV2 period, the use of personal protective equipment related to the work environment, the use of viral diagnostic tests, and other details of work procedures related to the pandemic were asked.

The C19P-S scale is a Likert scale in which each response is scored between 1 and 5. The responses obtained were scored as follows: 1 'strongly disagree,' 2 'disagree,' 3 'agree,' 4 'generally agree,' and 5 'strongly agree.'

In scale;

- Items 1,5,9,13,17, and 20 measure the psychological sub-dimension.
- Items 2,6,10,14, and 18 measure the somatic sub-dimension.
- Items 3,7,11,15, and 19 measure the social sub-dimension.
- Items 4,8,12, and 16 measure the economic sub-dimension.

The C19P-S total score is the sum of the scores of the sub-dimensions. The score ranges from 20 to 100 points, and a high score indicates coronaphobia in general or in the sub-dimensions. Cronbach α has been reported to be 0.92 for the developed scale [14].

"Measurement of Knowledge and Awareness of Forensic Science Experts and Technicians in the SARS-CoV2 Pandemic Period Form" included questions on the general contagion characteristics of forensic science experts and technicians regarding the SARS-CoV2 pandemic, the use of personal protective equipment the work environment, the use of viral diagnostic tests, and the details of work procedures under pandemic conditions. It consisted of 36 questions that participants could answer with "strongly disagree," "disagree," "I have no idea," "agree," and "strongly agree." Correct answers to each question on the form had been agreed upon before through literature search and official regulations, and the number of correct answers in the questionnaire indicated the participant's total knowledge score. The scores from the answers on the form were calculated to reach the total score, and the score of the form ranged from 0 to 36 points. The intention during the structuring of the form was to examine the detailed attitudes of the participants, with a five-point scoring system, by discussing how confidently they answered in a particular sense. However, due to the importance of the statistical power of the groups, it was unavoidable to use two parameters "Correct" and "Incorrect" instead of the five-point system, to ensure significance. Thus, given the number of participant groups in the statistical analysis, the results analysis method of the form was changed to "Correct" and "Incorrect" instead of the five-point system by accepting the already negligible number (only one) of "I have no idea" answers as "Incorrect" and by reducing the expressions "Absolutely."

Electronic media and face-to-face interview techniques were used for data collection.

Data were analyzed using the SPSS 22.0 package program (IBM Corp. Armonk, NY, USA). First, explanatory factor analysis was applied to the obtained data and Cronbach's alpha coefficient was checked to test the reliability of the scales. Kolmogorov-Smirnov and Shapiro-Wilk tests were used to determine whether the data were suitable for normal distribution. Parametric and nonparametric tests were applied depending on whether the data were normally distributed. The relationship of the continuous variables to each other was examined using Spearman's correlation coefficient. T-test and Mann Whitney U were used to compare the total scores of the scales between the two groups, while the Kruskal-Wallis test was used to compare three or more groups. Percentage of the total variance, Cronbach's alpha coefficient, mean, standard deviation, median, minimum score, maximum score, frequency, and percentages were given as descriptive statistics. Statistically, $p < 0.05$ was considered significant.

Results

Responses were received through the questionnaire conducted between 10/01/2020 and 30/11/2020 in the Presidency Unit of the Council of Forensic Medicine. The number of responses was 295 and because it had been determined that the sample had to include at least 230 people, 295 participants were found enough, while trying to increase also the confidence level of the group numbers was important (Table 1).

When the total scores of the Coronavirus 19 Phobia Scale (C19P-S) were examined, it was found that the total score of coronaphobia was 50.80 ± 14.56 while in the original publication of the scale it was 65.42 ± 14.09 [14]. Because it was determined that the high total score was indicative of coronaphobia and no categorization

was given for the total score, the mean score obtained in this study was classified as "moderate" (Table 2).

Table 1. General characteristics of the participants (n=295)

General Information of Participants		n	Percent%
Gender	Male	166	56.3
	Female	129	43.7
Age range	18-27	72	24.4
	28-37	151	51.2
	38-47	40	13.6
	48-57	24	8.1
	≥58	8	2.7
Profession	Forensic medicine specialist	51	17.3
	Forensic medicine resident	79	26.8
	Other specialist physician	24	8.1
	Other expert	32	10.8
	Engineer	36	12.2
	Technician	73	24.7
Unit of Work	Specialized department	200	67.8
	Specialized board	95	32.2
Education Level	Associate degree	58	19.7
	Bachelor degree	60	20.3
	Postgraduate degree	177	60
Professional experience	1 – 5 years	141	47.8
	5 – 10 years	66	22.4
	10 – 15 years	34	11.5
	15 – 20 years	12	4.1
	20 – 25 years	20	6.8
	25 – 30 years	12	4.1
	≥30 years	10	3.4

Table 2. Mean, standard deviation, Cronbach's alpha, percentage of total variance of total score and sub-dimensions of Coronavirus 19 Phobia Scale (C19P - S)

Sub-dimensions	Participant (n)	Mean Value	Standard Deviation	Median	Minimum Score	Maximum Score	Cronbach Alpha Value	Percentage of Total Variance (%)
Psychological	295	18.69	± 5.73	19	6	30	0.844	56.50
Psychosomatic	295	8.93	± 3.72	9	5	25	0.867	65.65
Social	295	14.65	± 4.47	15	5	25	0.772	52.42
Economic	295	8.54	± 3.39	8	4	20	0.794	61.98
C19P – S Total Score	295	50.80	±14.56	50	20	100	0.922	62.185

When the relationship between the total scores of the C19P-S scale sub-dimensions was examined using the Spearman correlation coefficient, there were statistically significant and moderate correlation results between the psychological and the psychosomatic sub-dimension scores ($r=0.531$; $p < 0.001$); between the psychological and economic sub-dimension scores ($r=0.458$; $p < 0.001$); between the psychosomatic and social sub-dimension scores ($r=0.556$; $p < 0.001$); between the psychosomatic and economic sub-dimension scores ($r=0.585$; $p < 0.001$) and between the social and economic sub-dimension score ($r=0.479$; $p < 0.001$); while a statistically significant positive and high degree of correlation was found between the psychological and social sub-dimension scores ($r=0.780$; $p < 0.001$) (Table 3).

Since $KMO=0.924 > 0.700$ and $p < 0.05$ values of the questions asked with the Coronavirus 19 Phobia Scale (C19P-S), which constitutes the second part of the questionnaire, fulfilled the required condition, it was considered that this questionnaire was statistically suitable for factor analysis. The reliability test performed for the quality scale with 20 questions resulted in a Cronbach's alpha coefficient of 0.922 for all questions, thus no situation required the deletion of a question from the survey. The result of the factor analysis was divided into four factors using the Varimax rotation method, and it was determined that these four factors explained 62.19% of the total variance. This percentage of explanation was determined to be adequate (Table 4).

Table 3. Sub-dimension correlation analysis of the Coronavirus 19 Phobia Scale (C19P-S)

			Psychological	Psychosomatic	Social	Economic
Spearman's rho	Psychological	r_s	1.000	.531**	.780**	.458**
		P		p<0.001	p<0.001	p<0.001
	Psychosomatic	r_s		1.000	.556**	.585**
		P			p<0.001	p<0.001
	Social	r_s			1.000	.479**
		P				p<0.001
	Economic	r_s				1.000
		P				

** Spearman's Correlation Coefficient

Table 4. Factor analysis of the Coronavirus 19 Phobia scale (C19P – S)

Questions	Components (Sub-dimensions)			
	Psychological	Psychosomatic	Social	Economic
Psychological 1	.750			
Psychological 2	.695			
Psychological 3	.669			
Psychological 4	.660			
Psychological 5	.588			
Psychological 6	.498			
Psychosomatic 1		.832		
Psychosomatic 2		.777		
Psychosomatic 3		.721		
Psychosomatic 4		.713		
Psychosomatic 5		.548		
Social 1			.763	
Social 2			.606	
Social 3			.584	
Social 4			.534	
Social 5			.502	
Economic 1				.824
Economic 2				.786
Economic 3				.643
Economic 4				.497
Factor Eigenvalues	8.286	1.939	1.185	1.027
Cronbach alpha	0.832	0.867	0.811	0.794
Variance (%)	41.430	9.696	5.925	5.134
Total Variance Result (%)=62.185; KMO** value=0.924, p<0.001; Cronbach alpha=0.922				

**KMO: Kaiser-Meyer-Olkin value

Afterward, the questions asked to the participants to evaluate their knowledge were scored as "correct-1" and "incorrect-0". As indicated in the methods section, the highest score that can be obtained from 36 questions presented to the participants in the survey was determined as "36," and the lowest score was set as "0". The mean of the total knowledge score based on the correct answer percentage was 22 and it was classified as "moderate."

Although it was not a validated scale, since $KMO=0.850>0.700$ and $p<0.05$ values for the questions in the "Measurement of Knowledge and Awareness of Forensic Science Experts and Technicians in the SARS-CoV2 Pandemic Period Form", which is the third part of the questionnaire, fulfilled the required condition, it was assumed that this part was also statistically suitable for the application of factor analysis. As a result of the reliability test performed for the 36-question knowledge and awareness scale, the

Cronbach's alpha coefficient for all questions gave a high result of 0.884, thus in no situation did a question have to be removed from the survey. The result of the factor analysis was divided into seven factors using the Varimax rotation method, and it was determined that these seven factors explained 50.09% of the total variance. This percentage of explanation was determined to be statistically acceptable (Table 5).

After the inner and total tests for the C19P-S Scale and the "Measurement of Knowledge and Awareness of Forensic Science Experts and Technicians in the SARS-CoV2 Pandemic Period Form", below are the important results of the comparison of the total knowledge scores, total C19P-S scale scores and sub-dimensions of the C19P-S with different parameters (gender, unit of work, education level, and profession), other details of these comparisons are given in the tables:

Table 5. Factor analysis of the measurement of knowledge and awareness of forensic science experts and technicians in the SAR–oV2 period

	Components						
	1.Sub-dimension	2.Sub-dimension	3.Sub-dimension	4.Sub-dimension	5.Sub-dimension	6.Sub-dimension	7.Sub-dimension
BD20	.729						
BD24	.703						
BD30	.699						
BD19	.692						
BD29	.671						
BD25	.666						
BD35	.645						
BD18	.637						
BD22	.598						
BD28	.576						
BD31	.556						
BD32	.514						
BD36	.493						
BD34	.428						
BD21		.627					
BD23		.555					
BD14		.540					
BD33		.440					
BD15		-.428					
BD2			.858				
BD1			.806				
BD11			.406				
BD6				.660			
BD12				.574			
BD17				.487			
BD27				.394			
BD4					.811		
BD5					.741		
BD3					.462		
BD13						.665	
BD16						.436	
BD9						-.381	
BD10							.640
BD7							.533
BD26							-.485
BD8							.392
Factor Eigenvalues	8.015	2.599	1.836	1.585	1.442	1.330	1.226
Variance (%)	22.264	7.219	5.101	4.403	4.005	3.693	3.405
Total Variance Result (%)=50.09; KMO Value=0.850, p<0.001; Cronbach Alpha =0.884							
*KA: Knowledge Assessment items, **KMO: Kaiser-Meyer-Olkin value							

The Parameter of ‘Gender’

In the comparison of the psychological sub-dimension scores of the participants by gender, a statistically significant difference was found ($p<0.001$) while other sub-dimension scores did not give significance. Accordingly, the mean score of the psychological sub-dimension was higher in female participants than in male participants. In the comparison of the C19P-S total scale score according to the gender of the participants, again a statistically significant difference was found ($p=0.013$). The mean total score of the C19P-S scale was higher in female participants than in male participants (Table 6).

The Parameter of ‘Unit of Work’

When the mean total knowledge score of the participants was compared according to the unit in which they work, no statistically significant difference was found between them ($p=0.653$). When comparing by the unit in which they work, there was a statistically significant relationship between the scores of the psychological ($p=0.003$), psychosomatic ($p=0.010$), social ($p=0.043$), and economic ($p=0.030$) sub-dimensions and the total score ($p=0.005$). Accordingly, the mean scores of the specialized department participants' psychological, psychosomatic, social, and economic sub-dimensions were higher than those of the specialized board

participants. Also, the mean of the C19P-S scale total score of the specialized department participants was higher than that of the specialized board participants (Table 7).

The Parameter of 'Educational Level'

In the comparison of the mean total score for knowledge assessment, the total scores for psychological, psychosomatic, and social sub-dimensions depending on the educational level of the participants revealed a statistically significant difference between them ($p<0.001$), ($p=0.016$), ($p=0.004$), ($p=0.003$). Accordingly, these comparisons revealed that the mean total knowledge score

of the participants having bachelor's degrees was lower than the scores of associate and postgraduate degree groups. However, when comparing the mean total scores of economic sub-dimension and C19P - S total scale scores by educational level, it was determined that there was no statistically significant difference between them ($p=0.174$), ($p=0.053$) (Table 8). The other statistically significant comparisons revealed that the psychological sub-dimension score of the postgraduate degree group was lower than the score of the associate degree group ($p=0.016$) and the psychosomatic and social sub-dimensions score of the postgraduate degree group was lower than the score of the bachelor degree group ($p=0.004$) ($p=0.003$).

Table 6. Comparison of gender with total score, sub-dimension scores of Knowledge and Awareness measurement form in the SARS - CoV2 period and total score of the C19P - S scale among forensic science experts and technicians

Gender	Knowledge A. Total Score**	Psychological	Psychosomatic	Social	Economic	Total C19P – S score	
N	166	166	166	166	166	166	
Male	Median(min-max)	22(2-35)	18(6-30)	8,5(5-25)	14(5-25)	8(4-20)	48.5(21-100)
	mean±SD.	21.3±7.68	17.69±5.59	8,69±3,86	14.31±4.40	8.30±3.39	49.01±14.69
N	129	129	129	129	129	129	
Female	Median(min-max)	25(6-32)	20(6-30)	9(5-21)	15(5-24)	8(4-19)	52(20-92)
	mean±SD.	22.91±6.73	19.96±5.67	9,23±3,51	15.06±4.53	8.82±3.36	53.09±14.12
P	.074	p<0.001*	.068	.180	.093	.013*	

*Mann Whitney U Test ** Knowledge Assessment Total score

Table 7. Comparison of the unit of work with the total score of Knowledge and Awareness measurement form in the SARS-CoV2 period and the sub-dimension scores and the total score of the C19P-S scale among forensic science experts and technicians

Unit of work	N	Mean	Standard Devia-tion	p-value
Knowledge A. Total Score **	Specialized Department	200	21.88	±7.665
	Specialized Board	95	22.27	±6.540
Psychological	Specialized Department	200	19.37	±5.576
	Specialized Board	95	17.26	±5.828
Psychosomatic	Specialized Department	200	9.31	±3.951
	Specialized Board	95	8.13	±3.050
Social	Specialized Department	200	15.01	±4.620
	Specialized Board	95	13.88	±4.052
Economic	Specialized Department	200	8.83	±3.492
	Specialized Board	95	7.92	±3.090
Total C19P – S Score	Specialized Department	200	52.51	±14.89
	Specialized Board	95	47.18	±13.22

*Independent Samples Test **Knowledge Assessment Total score

Table 8. Comparison of the educational level with the total score of Knowledge and Awareness measurement form in the SARS-CoV2 period and the sub-dimension scores and the total score of the C19P-S scale among forensic science experts and technicians

Educational Level	Knowledge A. Total Score**	Psychological	Psychosomatic	Social	Economic	Total C19P – S Score	
N	58	58	58	58	58	58	
Associate	Median(min-max)	25.50 (6-35)	20.50 (8-30)	9.50 (5-25)	16 (5-25)	8 (4-20)	54(24-100)
	mean± SD	23.74 ± 6.52	20.05 ± 5.46	9.74 ± 4.61	15.50 ± 4.66	9.17 ± 4.26	54.46±16.39
N	60	60	60	60	60	60	
Bachelor	Median(min-max)	16 (2-35)	20 (8-30)	10 (5-21)	16 (8-23)	8 (4-16)	52.5(25-88)
	mean± SD	16.57 ± 7.51	19.55± 5.28	10.08± 4.06	15.95± 4.15	9.02 ± 3.27	54.6±14.13
N	177	177	177	177	177	177	
Postgraduate	Median(min-max)	25 (6-35)	18 (6-30)	8 (5-17)	14 (5-24)	8 (4-19)	46.50(20-81)
	mean± SD	23.29 ± 6.63	17.95 ± 5.87	8.27 ± 3.10	13.93 ± 4.39	8.16 ± 3.06	48.31 ± 13.82
P	*<0.001	*0.016	*0.004	*0.003	0.174	0.053	

*Nonparametric-Kruskall Wallis Test **Knowledge Assessment Total score

The Parameter of 'Profession'

In the comparison of the mean scores of the knowledge assessment according to the profession, a statistically significant difference ($p < 0.001$) was found. These comparisons revealed that the knowledge score of the engineering group was lower than the other groups and the knowledge score of the other expert group was lower than the other groups except the engineering group. The comparison of the psychological, psychosomatic, social, and economic sub-dimension scores of the participants according to profession revealed a statistically significant difference between the psychological ($p = 0.004$), psychosomatic ($p = 0.025$), and social

($p = 0.004$) sub-dimension scores. Accordingly, the psychological, psychosomatic, and social sub-dimension scores of the technician group were higher than the scores of the forensic medicine specialist and forensic medicine resident groups. However, when comparing the profession and economic sub-dimensions scores, no statistically significant difference was found ($p = 0.206$) (Table 9). When the mean total score of the C19P - S scale according to the profession of the participants was compared, a statistically significant difference was found between them ($p = 0.004$). This comparison showed that the highest mean total score on the C19P-S scale was in the technician's group (Table 10).

Table 9. Comparison of the profession with the total score of Knowledge and Awareness measurement form in the SARS - CoV2 period and the sub-dimension scores of the C19P - S scale among forensic science experts and technicians

Profession		Knowledge A. Total Score**	Psychological	Psychosomatic	Social	Economic
	N	51	51	51	51	51
Forensic Medicine Specialist	median(min-max)	27(9-35)	17(6-30)	9(5-17)	14(5-21)	8 (4-19)
	mean \pm SD	24.78 \pm 5.98	17.08 \pm 5.65	8.39 \pm 3.03	13.69 \pm 3.97	8.35 \pm 3.16
	N	79	79	79	79	79
Forensic Medicine Resident	median(min-max)	27 (8-33)	18 (6-30)	7 (5-17)	13 (6-24)	8 (4-16)
	mean \pm SD	24.78 \pm 5.53	17.76 \pm 6.14	7.97 \pm 3.17	13.49 \pm 4.64	8.19 \pm 3.09
	N	24	24	24	24	24
Other Specialist Physician	median(min-max)	24 (7-31)	19 (6-27)	9.5 (5-16)	14 (5-20)	8 (4-16)
	mean \pm SD	21.04 \pm 7.66	17.50 \pm 5.70	8.92 \pm 3.08	14.38 \pm 4.05	7.71 \pm 3.01
	N	32	32	32	32	32
Other Expert	median(min-max)	18.50 (6-32)	20 (10-30)	8.5 (5-21)	15.5 (5-22)	8 (4-16)
	mean \pm SD	18.56 \pm 5.51	20.13 \pm 5.64	8.97 \pm 3.99	15.13 \pm 4.67	8.31 \pm 3.27
	N	36	36	36	36	36
Engineer	median(min-max)	12(2-22)	19 (8-28)	9.5 (5-20)	15 (8-23)	8 (4-14)
	mean \pm SD	12.00 \pm 4.95	19.08 \pm 4.86	9.47 \pm 3.38	15.25 \pm 3.62	8.03 \pm 2.68
	N	73	73	73	73	73
Technician	median(min-max)	26 (6-35)	21 (8-30)	10 (5-25)	17 (5-25)	8 (4-20)
	mean \pm SD	23.84 \pm 6.61	20.38 \pm 5.34	10.05 \pm 4.60	16.15 \pm 4.65	9.66 \pm 4.10
P		* < 0.001	* 0.004	* 0.025	* 0.004	0.206

* Nonparametric-Kruskal Wallis Test, ** Knowledge Assessment Total score

Table 10. Comparison of profession and total score of Coronavirus 19 Phobia Scale (C19P - S)

Profession	Participant (n)	Median	Min. Score	Max. Score	Mean	Standard Deviation
Forensic Medicine Specialist	51	48	24	78	47.50	\pm 13.06
Forensic Medicine Resident	79	46	21	7	47.41	\pm 14.36
Other Specialist Physician	24	49	20	76	48.50	\pm 12.53
Other Expert	32	51.5	24	88	52.53	\pm 14.57
Engineer	36	51	25	81	51.83	\pm 11.69
Technician	73	55	24	100	56.24	\pm 16.19
Total	295	50	20	100	50.80	\pm14.56
p-value .004*						

*Kruskal-Wallis Test

Discussion

The first requirement for protection against a pandemic that affects the whole world, such as SARS-CoV2, is to have accurate and sufficient knowledge about the transmission and prevention methods of the infectious pandemic. Acquiring health literacy has a positive impact on society and individual awareness of measures against infectious diseases. While individuals and societies with high or sufficient levels of health literacy are more vulnerable to pandemics, low health literacy may prevent people from learning about pandemics and incorporating preventive measures into their behavior. However, just as important as population knowledge are working conditions free of negative stress, in which health care professionals can use their level of knowledge and general competencies. In this sense, the possible factors in the parameters of the groups were discussed by carefully measuring their knowledge and stress levels about the role of forensic science experts in the Council of Forensic Medicine. Because the continuity of the institutional duties of the Council of Forensic Medicine is absolutely important as one of the stakeholders of the disaster plans including pandemics [15].

Total Psychiatric Outcomes

In a study conducted by Wang et al. [16] at the beginning of the SARS-CoV2 pandemic in China, it was reported that more than half of the participants had moderate levels of anxiety and psychological impact of the pandemic during the acute phase of the epidemic. In the study conducted by Arpacı et al. [14] in Turkey, the mean total C19P-S score was determined to be high, whereas, in the study conducted by Ekiz et al. [17] on the health anxiety levels of individuals with the SARS-CoV2 pandemic, a moderate level was determined.

The mean rating of forensic science experts and technicians of C19P - S in this study was moderate. The results of the study are largely consistent with the literature. In addition, it was found that the mean scores of psychological and social sub-dimensions were moderate, but those of psychosomatic and economic sub-dimensions were low. These results concluded that the SARS-CoV2 pandemic induced moderate phobia directly or indirectly and it hurt psychological and social fields of life while it did not affect the quality of work and general quality of life.

Psychiatric Outcomes and Gender Relationship

In the study conducted by Polat et al. [18] on health care professionals during the SARS-CoV2 pandemic, the anxiety and stress scores of female hospital workers were significantly higher than those of male hospital workers. Yıldırım et al.'s [19] study on the psychological state of healthcare professionals during the SARS-CoV2 pandemic revealed that the anxiety and depression levels of female healthcare professionals were higher than those of male healthcare professionals. And in the study by Çölgeçen et al. [20], it was found that state and trait anxiety levels were higher in females than in males.

When the mean scores of the C19P-S scale were evaluated by gender in this study, it was determined that female participants had higher mean total scores than male participants ($p=0.013$). In addition, the mean scores of the psychological sub-dimension were

higher for the female participants than for the male participants. It was suggested that this might be because females are more susceptible to stress through their hormone systems and their life perceptions of "no harm, not be harmed".

Psychiatric Outcomes and Unit of Work Relationship

Health care professionals are on the front lines of the fight against the SARS-CoV2 pandemic. In the SARS-CoV2 exposure risk classification, health care professionals who come into contact with infected persons, perform aerosol-generating procedures (intubation, tracheostomy, etc.), collect and transport culture specimens, and perform autopsies on infected persons are defined as "high" or "very high" risky professional groups [21].

In the review by Naushad et al. [22], health care professionals in the emergency department, critical care, and infectious medicine had more psychological problems regarding the unit in which they worked. In the study by Karaman et al. [23] with health care professionals working in the SARS-CoV2 pandemic, it was mentioned that physicians and nurses who had direct jobs and responsibilities during the treatment process had more depression symptoms than other groups of participants.

In this study, a statistically significant difference was found when the total score of the C19P-S scale was evaluated according to the unit worked ($p<0.05$). Accordingly, it was observed that the participants who worked in the specialized departments were more psychologically affected by the SARS-CoV2 pandemic. Undoubtedly, all forensic science experts were negatively affected by the SARS-CoV2 pandemic. However, groups working in specialized departments, i.e., mainly in the laboratory environment and biological specimen collection, may have more psychological difficulties due to the risk of contamination during the pandemic process as well as the workload that may accumulate for various reasons, such as deferred applications in infection control measures, etc. In this context, it is known that mortuary personnel, who are active and intensive during the pandemic process, are the riskiest group in the pandemic in terms of contamination risk and the nosocomial dimension of the environment, both because they come into contact with the bodies during autopsy and postmortem examination and because they are in the same environment as the relatives during the transfer of the bodies. For this reason, it can be assumed that the participants of the specialized department of mortuary are more prone to stress and psychological disorders and they were the most crowded group of participants among the specialized departments constituting the higher ratio of specialized departments in this study.

Psychiatric Outcomes and Educational Level Relationship

In a nationwide study by Qui et al. [3] among Chinese who had contracted the SARS-CoV2 pandemic in China, it was reported that individuals with higher levels of education were more prone to psychological depression. In a study by Havlioğlu et al. [24] in our country, which examined the anxiety level of emergency medical services personnel involved in the pandemic, there was no significant relationship between education level and anxiety. In addition, Yıldırım et al. [19] found no significant relationship between education level and anxiety and depression in their studies on the psychological state of health care professionals. In a study

by Hoşgör et al. [25], which examined the relationship between SARS-CoV2 anxiety and professional performance in emergency medical services, it was shown that there was no significant relationship between education level and SARS-CoV2 anxiety.

In this study, although there was statistical significance in the psychological, psychosomatic, and social sub-dimensions of the scale as a function of educational level, no statistically significant relationship was determined when comparing the economic sub-dimension scores and the total scale scores. The fact that the total scale scores were lower in study participants with a postgraduate degree than in the other groups suggested that a higher level of education might positively influence the perception of health control. However, this is inconsistent with the data from Qui et al.'s [3] study in China. Therefore, more comprehensive studies are needed to clarify this issue.

Psychiatric Outcomes and Profession Relationship

In the study by Zhang et al. [26] on the mental health and psychosocial problems of health care professionals in China during the SARS-CoV2 process, medical health care professionals suffered from obsessive-compulsive symptoms, insomnia, anxiety, depression, somatic disorders, and insomnia symptoms more frequently than nonmedical health care professionals. In a study conducted by Wong et al. [27] on emergency medical services personnel during the SARS pandemic, it was concluded that psychological stress level was higher among nurses than among physicians and medical support personnel. On the other hand, some studies among health care professionals during the SARS-CoV2 pandemic in Turkey showed no significant relationship between depression, anxiety, and stress among the different professional groups [18,24].

In this study, among the participants from six different professional groups, the group with the highest C19P - S total score mean was the technicians. This could be related to the fact that their profession involves contact with biological specimens, invasive procedures that may generate aerosols, and working in an environment where they are more likely to come into contact with people and where the environment is more crowded. The fact that the mean scores of the forensic medicine specialist and forensic medicine resident groups were lower than those of the other four groups may be related to these groups' clinical knowledge and experience, as well as the positive educational effect of rotations and shift-based work in high-risk departments during their training.

Knowledge Level and Gender Relationship

Studies by Li et al. [28] in England and by Clements et al. [29] in the United States reported that women and older people knew more about the epidemic during the SARS-CoV2 pandemic. In a study conducted by Ergün et al. [30] with personnel working in emergency medical services in Turkey, it was found that there was no difference between male and female participants in the adequacy of personal knowledge, and adequacy of personal precautions, and mean frequency of PPE replacement. Similarly, in the study conducted by Sizer et al. [31] on the knowledge level of patients presenting to the ENT outpatient clinic in Turkey, it was shown that there was no relationship between gender and knowledge level.

When the total knowledge assessment scores were examined by gender in this study, it was determined that males (21.3 ± 7.68) and females (22.91 ± 6.73) had moderate knowledge levels and no statistical difference existed between them. This result is consistent with the studies conducted in our country, but not with the studies conducted in the United Kingdom and the United States. These results suggest that the SARS-CoV2 pandemic in our country was followed with similar attention and care by the male and female populations.

Knowledge Level and Unit of Work Relationship

In a study that investigated SARS-CoV2 knowledge and awareness among general practitioners and specialists in Turkey, it was found that the awareness level of physicians working in primary care was higher than that of physicians working in secondary and tertiary care [32]. In a study investigating the knowledge level and protection level of emergency medical services personnel, it was concluded that participants did not differ between the units in which they worked. However, the frequency of PPE replacement was higher among personnel working in emergency medical services stations-and thus the likelihood of coming into contact with infected persons was higher-than among personnel working in provincial control centers and health directorates [30].

In this study, when the total knowledge assessment scores were examined, it was observed that the value in specialized departments was 21.88 ± 7.66 and in specialized boards was 22.27 ± 6.54 , and there was no statistical difference between participants working in two different units in terms of knowledge levels ($p=0.653$). The reason for this was considered to be that the Council of Forensic Medicine was able to make the education about SARS-CoV2 in all units and the perception of its importance was largely homogeneous.

Knowledge Level and Educational Level Relationship

Studies conducted in Saudi Arabia examined the knowledge of SARS-CoV2 and the attitudes and behaviors of dental health professionals. It was found that the knowledge levels of individuals were correlated with their education levels, the knowledge levels of participants having associate, bachelor, and postgraduate degree education levels were higher than that of primary and high school graduates [33,34]. In a study conducted in Turkey, it was stated that there was no significant difference between the adequacy of personal SARS-CoV2 knowledge of medical personnel and their educational status, but there were significant differences in the frequency of PPE replacement. The frequency of PPE replacement was lower among medical personnel with secondary school graduate degrees but increased with higher educational levels [30].

In this study, a statistically significant relationship ($p<0.01$) was found when educational level and total knowledge assessment scores were compared. It was determined that the knowledge level of participants with a bachelor's degree was lower than that of participants with an associate degree and postgraduate degree. Accordingly, health care professionals' knowledge level about the SARS-CoV2 pandemic differed regarding the variable of educational status, but there was no linear correlation. The reason for this curve is the fact that most of the bachelor's degree holders who worked in the Council of Forensic Medicine were from non-

health professions, including engineers and other experts, while most of the individuals who had an associate or postgraduate degree education level were health care professionals.

Knowledge Level and Profession Relationship

In the study by Zhang et al. [35] that examined the knowledge, attitudes, and behaviors of health care professionals in China, it was found that the knowledge scores of physicians were significantly higher than those of nurses and other health care professionals. In a study by Albarrak et al. [36] in which they examined the knowledge and attitudes of health care professionals on Middle East Respiratory Syndrome (MERS) in a university hospital in Saudi Arabia, it was noted that the general knowledge levels were high and the knowledge levels of physicians were significantly higher than those of other health care professionals. However, there was no significant difference between the mean scores for attitudes.

In the study by Ceyhan and Uzuntarla [37] examining the knowledge, attitudes, and behaviors of academic personnel at a state university in Turkey regarding SARS-CoV2, 83.6% of the participants were found to have moderate levels of knowledge, 82% had high levels of attitudes, and 88% had high levels of behaviors. Their general knowledge, attitudes, and behaviors were at a high level. In the knowledge and awareness survey conducted among physicians in public hospitals in Kayseri Province, Turkey, it was emphasized that more than half of the physicians correctly answered the questions on general knowledge, modes of transmission, and prevention methods about SARS-CoV2 [32].

In this study, a statistically significant relationship was found when the total knowledge assessment scores of the participants and their profession were compared ($p < 0.001$). Accordingly, the majority of participants had moderate knowledge levels, while participants who worked as engineers had the lowest total knowledge assessment scores. Participants who worked as forensic medicine specialists and forensic medicine residents had the highest total knowledge assessment scores. In the study, technicians' mean total knowledge scores were higher than those of participants working as other experts and other specialist physicians. The fact that total knowledge scores varied greatly by the profession is likely because, compared to other groups, forensic medicine specialists and forensic medicine residents receive more advanced medical education and are better informed and educated about methods to protect against infectious diseases during their professional development stages.

Limitations of the Study

With the aim of the study to determine the levels of knowledge and anxiety of forensic science experts working in the Council of Forensic Medicine Presidency, the total number of participants was met or exceeded when the universe of the study was considered. However, when the number of participants was evaluated on a group basis, according to the formulation presented, a very high representation value could be obtained for some groups, but for "other specialist physicians", "engineers", and "other expert" groups, the number of participants was somewhat lower than the expected possible representation value. This difference in distribution between groups was unavoidable due to the unequal

distribution of personnel numbers between forensic medicine physicians and engineers or other specialist physicians in the Council of Forensic Medicine. In other words, since great efforts were made to achieve the maximum number of participants, this unequal distribution in group numbers was not because there was a lack of planning from the beginning of the study, but because this natural personnel distribution already shaped the maximum number of participant groups that could be achieved in the study.

Conclusion

In this study of the SARS - CoV2 pandemic;

There was no relationship between knowledge level and gender,

There was no relationship between knowledge level and unit of work,

The knowledge level of bachelor's degree participants was lower than that of associate degree and postgraduate degree participants,

The knowledge level of participants who were forensic medicine specialists and forensic medicine residents was higher than that of other professional groups, and engineers had the lowest knowledge level among the participating groups,

Knowledge level and anxiety level of SARS - CoV2 were moderate,

Female participants were more psychologically affected by the pandemic than male participants,

Participants working in specialized departments were more psychologically affected by the pandemic than participants working on specialized boards,

When participants' stress levels were assessed according to their educational status, the stress level of the group with a postgraduate degree was lower in points, but did not reach statistical significance,

Participants who worked as technicians were more psychologically affected by the pandemic than other professional groups.

In addition to the stress of working with the high risk of infection during the pandemic, the workload that can accumulate for various reasons, such as deferred infection control tasks, etc., can also affect forensic science workers psychologically.

Deferred and unfulfilled workloads can cause tension and stress among forensic science workers and hurt the individual's psychological states. In addition, mortuary workers who are actively and intensively working during the pandemic are more susceptible to stress and psychological disorders in terms of the risk of transmission of infectious diseases. Mortuary workers are the forensic science workers most exposed to the risk of infection because they come into contact with corpses during autopsy and postmortem examinations and because they are in the same environment with their relatives when the corpses are handed over. On the other hand, considering the differences between the groups, the moderate level of stress shows that the coping mechanisms can be broadly applied.

The moderate knowledge level of the study participants shows

that individuals need to read and research more about health specifically for SARS - CoV2. However, this situation can also be attributed to the lack of clear information about SARS - CoV2 and even the fact that there is significant information contamination.

Factors such as the increased risk of infection due to the SARS - CoV2 pandemic, access to treatment and diagnostic tests, delayed applications, etc., have a negative psychological impact on individuals. Regarding the stress and psychological impact of the pandemic on study participants;

- Avoiding stress sources by limiting them,
- Spending productive time with their loved ones to relieve stress,
- Maintaining their vital routines (sleeping patterns, eating habits, etc.) by improving them,
- Focusing on and raising awareness of the benefits of pandemic interventions,
- Seeking professional support when needed to reduce the impact of the stress they are exposed to,
- *Establishing work guidelines that minimize stress and indirect accidents – errors by taking into account the weariness of the process by the competent institutions, are recommended.*

This study was produced from a master's thesis in 2021 within the scope of Bezmialem Vakıf University Health Sciences Institute, Department of Disaster Management, Disaster Management Master's Program with Thesis, and was presented at the "International Medical Records Congress" held on 03 - 05 December 2021.

Conflict of interests

The authors have no financial or personal conflict of interest related to this article.

Financial Disclosure

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Ethical approval

Before starting the survey, the decision of the Ethics Committee of Bezmialem Vakıf University for Non-interventional Clinical Research dated 08/06/2020 with the number 08/181 was obtained. For conduction of the study, the approval of the Commission for Education and Scientific Research of the Council of Forensic Medicine dated 10/09/2020 with the number 2020/795 and the approval for the study of the Platform for Scientific Research of the General Directorate of Health Services of the Ministry of Health TR were obtained.

For the use of the C19P-S scale in the study, the responsible author was contacted by e-mail, and his consent to use was obtained. Based on the voluntary informed consent form prepared by the researchers, the necessary permissions were obtained from all participants before the conduction of the questionnaire. In addition, all study procedures followed the 1964 Declaration of Helsinki principles including its developed versions.

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