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Evaluation of Vaccine Hesitancy, Anti-Vaccination, and Anxiety Levels for Medical Secretaries During COVID-19 Pandemic

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Abstract

Objective: This study aimed to evaluate the vaccine hesitancy, anti-vaccination, and anxiety levels of medical secretaries during the pandemic.

Methods: This cross-sectional study was conducted on 161 medical secretaries working at the time of the Study. Sociodemographic characteristics form, Coronavirus Anxiety Scale (CAS), Vaccine Hesitancy Scale (VHS) adapted to the pandemic, and Anti-vaccination Scale (AVS) were used in the questionnaire form used to collect the data of the study.

Results: Median (IQR) CAS, VHS, and AVS scores of the participants were 2 (IQR=3), 32 (IQR=10), and 58 (IQR=16), respectively. 35.4 % of the participants were exposed to the COVID-19, and 87% were vaccinated against COVID-19. Participants' hesitations about the childhood and COVID-19 vaccines were 15.5 % and 49.1%, respectively. A significant relationship was found between the presence of Coronavirus anxiety and educational status (p=0.035), hesitancy against childhood vaccine (p=0.016), and working in COVID-19 Units (p=0.044). A statistically significant relationship was found between VHS scores and hesitancy against childhood vaccine (p=0.001), hesitancy against COVID-19 vaccine (p<0.001), vaccination against COVID-19 (p=0.014), belief that the COVID-19 vaccine is protective (p<0.001), and make COVID-19 vaccination mandatory (p<0.001). A significant relationship was found between AVS scores and vaccination against COVID-19 (p=0.002), hesitancy against COVID-19 vaccine (p<0.001), and belief that the COVID-19 vaccine is protective (p<0.001), making COVID-19 vaccination mandatory (p<0.001).

Conclusion: The concern about their parents' exposure to COVID-19 is high among secretaries. COVID 19 vaccine hesitancy is high among secretaries. During the pandemic, higher rates of anxiety were detected in secretaries and those working in COVID-19 units and lower in the high school education.

Key words: COVID-19 pandemic; Medical Secretaries, Coronavirus anxiety scale; Vaccine hesitance scale; Anti-vaccination scale

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COVID-19 Pandemisi Sırasında Tıbbi Sekreterlerin Aşı Tereddütü, Aşı Karşıtlığı ve Kaygı Düzeylerinin Değerlendirilmesi

Öz

Amaç: Bu çalışma, pandemi sırasında tıbbi sekreterlerin aşı tereddüt, aşı karşıtlığı ve kaygı düzeylerini değerlendirmeyi amaçlamıştır.

Yöntemler: Bu kesitsel çalışma, araştırma sırasında görev yapan 161 tıbbi sekreter üzerinde yapılmıştır. Çalışmanın verilerini toplamak için kullanılan anket formunda Sosyodemografik özellikler formu, Coronavirüs Anksiyete Ölçeği (CAS), pandemiye uyarlanmış Aşı Tereddüt Ölçeği (VHS) ve Aşı Karşıtı Ölçeği (AVS) kullanılmıştır.

Bulgular: Katılımcıların ortanca (çeyrekler arası aralık) CAS, VHS ve AVS skorları sırasıyla 2 (IQR=3), 32 (IQR=10) ve 58 (IQR=16) idi. Katılımcıların %35,4'ü COVID-19'a maruz kaldı ve %87'si COVID-19'a karşı aşılandı. Katılımcıların çocukluk ve COVID-19 aşıları konusundaki tereddütleri sırasıyla %15,5 ve %49,1 idi. Coronavirüs kaygısının varlığı ile eğitim durumu (p=0.035), çocukluk çağı aşılarına karşı tereddüt (p=0.016) ve COVID-19 ünitelerinde çalışma (p=0.044) arasında anlamlı bir ilişki bulundu. VHS puanları ile çocukluk çağı aşılarına karşı tereddüt (p=0.001), COVID-19 aşısına karşı tereddüt (p<0.001), COVID-19 aşısı olma (p=0.014), COVID-19 aşısının koruyucu olduğuna inanma (p<0.001), COVID-19 aşısını zorunlu hale getirme (p<0.001) arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur. AVS puanları ile COVID-19 aşısı olma durumu (p=0.002), COVID-19 aşısına karşı tereddüt (p<0.001), COVID-19 aşısının koruyucu olduğuna inanma (p<0.001) ve COVID-19 aşısını zorunlu hale getirme (p<0.001) arasında anlamlı bir ilişki bulundu.

Sonuçlar: Sekreterler arasında ebeveynlerinin COVID-19'a maruz kalmasıyla ilgili endişeler yüksektir. Sekreterler arasında COVID 19 aşı tereddütü yüksektir. Pandemi sürecinde sekreterlerde ve COVID-19 birimlerinde çalışanlarda daha yüksek, lise eğitiminde daha düşük kaygı oranları tespit edildi.

Anahtar kelimeler: COVID-19 pandemisi; Tıbbi Sekreterler; Coronavirüs anksiyete ölçeği; Aşı tereddütü ölçeği; Aşı karşıtlığı Ölçeği

INTRODUCTION

Coronaviruses are a family of viruses that can cause a wide range of diseases in humans, ranging from the common cold to severe acute respiratory syndrome. SARS-CoV caused Severe Acute Respiratory Syndrome (SARS) in 2003, MERS-CoV caused Middle East Respiratory Syndrome (MERS) in 2012, and, most recently, the SARS-CoV-2 viruses that caused COVID-19 in 2019 are the best-known members of the beta-coronavirus family. On December 31, 2019, after reporting the existence of pneumonia cases of unknown cause in Wuhan city of Hubei province of China, the World Health Organization (WHO) announced that the virus causing the disease is a member of the coronavirus family. The virus causing the disease was named 2019-nCoV by the WHO and SARS-CoV-2 by the International Committee on Taxonomy of Viruses (ICTV). In January, WHO declared the disease COVID-19 as the Public Health Emergency of International Concern (PHEIC). However, later on, due to the rapid spread, it declared COVID-19 a pandemic on March 11, 2020[1-4]. The first official COVID-19 case in Turkey was seen on March 11, 2020.

Primary prevention is considered important because of the lack of effective COVID-19 treatment and the high mortality and morbidity of the disease. Although mask, distance and hygiene rules are important to be protected from COVID-19, vaccination is considered important because vaccination also contributes to reducing mortality. For this purpose, efforts to produce vaccines have gained momentum in many centres and studies have been conducted to produce the most effective vaccine[5]. However, it is thought that vaccine hesitancy tends to increase due to the problems brought about by the pandemic, new vaccine production and serious information pollution in the society. Vaccine hesitancy is defined as a delay in accepting or rejecting vaccination despite the availability of vaccination services by the WHO[6]. In a comprehensive study with data from many countries in which the COVID-19 vaccine hesitancy situation was examined, vaccine hesitancy rates were expressed as 32%, 19%,

12%, 15%, and 31%, in the United States, Italy, Denmark, the UK and in our country, respectively[7].

In addition to the problems brought about by the vaccine hesitancy, it has been shown that the frequency of psychological problems such as depression, anxiety and stress has increased in the health personnel working at the forefront during the pandemic. In a study conducted in this framework, depression was found to be 20.6%, anxiety 27%, and stress 36.4% during the pandemic period in employees other than physicians and nurses[8]. Secretaries who work actively in hospital conditions during the pandemic period and who are not thought to have direct contact with the patient may also have increased the risk of experiencing stress, anxiety, and depression. Once a COVID-19 vaccination became available, more than half of healthcare practitioners were willing to use it. It was discovered that indecision rates were high, but rejection rates were not. Having a doctor's degree, more than ten years of professional experience, and being male were characteristics that influenced vaccination intent[9]. As far as is known, any medical studies investigating vaccine hesitation, anti-vaccination, and the anxiety levels of medical secretaries towards the COVID-19 vaccine have not been conducted so far.

Objectives: The primary aim of this study was to analyze the factors affecting vaccine hesitancy and anti-vaccination in medical secretaries during the pandemic. The second purpose was to evaluate the factors influencing the level of anxiety associated with COVID-19.

METHODS

1. Type, Place, and Time of Research

This survey-based descriptive and cross-sectional study was conducted between October 2021 and November 2021 at Inonu University Turgut Ozal Medical Centre using the face-to-face interview technique with the staff working as medical secretaries. Before starting the Study, preliminary permission was obtained from the Director of Turgut Ozal Medical Center (Approval no: 2021/22635).

2. Study Protocol and Ethics Committee Approval

This Study involving human participants was in accordance with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Ethical approval was obtained from the Inonu University Institutional Review Board (IRB) for non-interventional studies (2021/2536). The guidelines known as Strengthening the Reporting of Observational studies in Epidemiology (STROBE) were assessed in ensuring that the observational Study that was carried out was presented in a manner that is of a high quality in the current research[10].

3. Population and Sample of Research

260 medical secretaries actively working in the hospital during the abovementioned study period were determined as the population of this Study. In order to select a sample that can represent this universe, When Type I error amount (alpha) was chosen as 0.05, test power (1-beta) as 0.8, effect size as 0.23, and alternative hypothesis (H1) as two-tailed. the minimum number of participants required to find a significant difference was calculated as 149. Considering the data loss, a total of 175 participants were interviewed face-to-face and 161 medical secretaries who answered all questions were included in this Study. Primary and secondary outcome measures are Vaccine hesitancy scale (VHS), and Anti-vaccination scale (AVS) scores and the secondary outcome measure is COVID-19 anxiety status.

4. Parameters and Scales Used in the Study

4.1. Demographic and Social Characteristics Form

The questionnaire used in this Study consists of 28 questions and three scales. The questions querying the sociodemographic characteristics of the Study can be briefly defined as follows: variables such as age, gender, marital status, number of children, education level, smoking, working unit (service, intensive care, emergency unit, operating room, polyclinics), presence of chronic disease (diabetes mellitus, hypertension, asthma, COPD, cardiovascular disease), statuses of working in COVID-19 clinics during pandemic process, being infected with COVID-19 disease, being vaccinated against COVID-19, presence of hesitation about general vaccination programs, presence of hesitation about the COVID-19 vaccine, the status of believing in the protection of the COVID-19 vaccine, ideas on making the COVID-19 vaccine legally mandatory, status of catching COVID-19 disease, if COVID-19 was caught after vaccination, after which vaccine and after which dose and situations that worry the person during COVID-19 process were recorded.

4.2. Coronavirus Anxiety Scale- Short Form (CAS-SF)

CAS-SF, which aims to determine the severity of anxiety caused by the COVID-19 pandemic in society, was first defined by Lee in 2020[11]. According to the Study of Lee et al., factor loads of the items of the CAS-SF scale ranged from 0.81 to 0.88, while the Cronbach's alpha reliability and internal consistency coefficient of the Study was calculated as 0.93. The validity and reliability tests of the Turkish version of this scale were performed by Biçer et al. in 2020[12]. Biçer et al. showed that the factor loads of the items in the Turkish version of the CAS-SF scale, which consists of one dimension and 5 items, varied between 0.625 and 0.784. Biçer et al. calculated the Cronbach' s alpha reliability and internal consistency coefficient of this scale, which was adapted into Turkish, as 0.832. In CAS scale consisting of five-point Likert type questions, the scores are ranked as: not at all (0 point), rare, less than a day or two (1 point), several days (2 point), more than seven days (3 point) and nearly every day over the last two weeks (4 point). In this scale, where the lowest 0 points and the highest 20 points can be obtained, a score of 9 and above is considered as presence of coronavirus anxiety. Lee et al. calculated an optimal cut-off point for anxiety (≥ 9 points) using ROC curve analysis and calculated the sensitivity and specificity values of this cut-off point as 90% and 85% (AUC: 0.94, $p<0.001$), respectively.

4.3. Vaccine Hesitancy Scale (VHS) adapted to Pandemic

VHS was developed by Larson et al.[13] in 2015 to measure the level of vaccine hesitancy and possible reasons for it. The Turkish version of this scale was made by Çapar and Çinar [14] in 2021. In the Turkish version, the authors stated that they modified the scale for the pandemic and determined the name of this new version to be "VHS in Pandemics". The answers given to the VHS scale, which consists of five Likert type questions, are listed as strongly disagree (1 point), disagree (2 points), neither agree nor disagree (3 points), agree (4 points), strongly agree (5 points). The VHS scale consists of 10 items and two sub-dimensions. The first sub-dimension is called "lack of confidence" and all eight items in this sub-dimension are reverse coded. The items to be reverse coded (M1-8) are shown in the studies of Capar and Cinar[14]. High scores obtained from the lack of confidence sub-dimension indicate that the mistrust towards the vaccine increases in pandemics. The second sub-dimension is called ''risk'' and the above-mentioned order is used in coding the two items (M9-10) in this sub-dimension. High scores from the risk sub-dimension indicate that the risk of vaccination is high in pandemics. Therefore, when both sub-dimensions are evaluated together, high scores from the PVHS scale show that vaccine hesitancy is high in pandemics. In the Turkish version of the scale,

factor loads of the items were shown to vary between 0.638 and 0.887. Cronbach Alpha reliability and internal consistency coefficient of BRS was calculated as 0.901.

4.4. Anti-Vaccination Scale - Long Form (AVS-LF)

Kılınçarslan et al.[15] who claimed that some scales developed for vaccination opposition were adapted to Turkish and that they did not fully reflect the Turkish society, developed two scales in 2020 with long (AVS-LF) and short forms (AVS-SF), which completely reflect the Turkish society to solve this problem. However, while the authors used the term "Vaccine hesitancy" in the English title of the article, they used the term "Anti-vaccination" in the Turkish title. Since these two titles do not exactly overlap, it seems that the title "Anti-vaccination" that best reflects rejecting the vaccination would be more appropriate. The AVS-LF form we used in this Study consists of four sub-dimensions and 21 items. In the AVS-LF version, the factor loads of the items were shown to vary between 0.590 and 1,000. AVS-LF's Cronbach Alpha reliability and internal consistency coefficient was calculated as 0.905. The answers given to the AVS- PVHS scale, which consists of five Likert type questions, are listed as exactly disagree (1 point), disagree (2 point), partially agree (3 point), agree (4 point), exactly agree (5 point) The first sub-dimension is called "benefit and protective value of vaccine" and all five items (A1-A5) in this sub-dimension are reverse coded. The second sub-dimension is called "vaccine repugnance" and all six items (B1-B6) in this sub-dimension are plain coded. The third (C1-C5) and fourth (D1-D5) sub-dimensions are called "solutions for non-vaccination" and "legitimization of vaccine hesitancy", respectively, and all five items in these sub-dimensions are plain coded. A higher score on this scale indicates higher anti-vaccination.

5. Statistical Analysis

IBM SPSS (Statistical Package for the Social Sciences, Inc, Chicago, IL, USA) software program version 25.0 was used for statistical analysis. Shapiro Wilk test of normality was applied to show whether the quantitative variables had a normal distribution, and since it was seen that the quantitative variables did not have a normal distribution, the data were given as median, 95% Confidence Interval (CI) for median, and interquartile range (IQR). Qualitative variables were given as numbers and %. Chi-square test was used in statistical analyses, the non-parametric Mann-Whitney U test was used to compare two independent groups, and the Kruskal-Wallis H test was used to compare three or more independent groups. The Bonferroni-corrected Mann-Whitney U test was used for multiple comparisons after the significant Kruskal-Wallis H test. $p<0.05$ was considered statistically significant.

RESULTS

The median (IQR) age of the participants was 37 [(10); (95 % CI: 36-39)] years. 59% (n=95) of the participants were women and 73.9% (n=119) were married. 34.8% (n=56) of the participants were associate degree graduates and 70.2% (n=113) had at least one child. 68.9% (n=111) of the participants stated that they worked in the polyclinic, 59.6% (n=96) did not smoke, and 76.4% (n=123) stated that they did not have a chronic disease (Table 1).

Table I: Distribution of socio-demographic characteristics for the participants

Variables	n	%
Gender		
Female	95	59.0
Male	66	41.0
Marital status		
Married	119	73.9
Single	42	26.1
Educational status		
High school	55	34.2
Assoc graguate	56	34.8
Bachelor or postgraduate	50	31.1
Have you child?		
Yes	113	70.2
No	48	29.8
Working unit		
Service (wards)	28	17.4
Intensive care	11	6.8
Emergency unit	7	4.3
Operating room	4	2.5
Outpatient clinic	111	68.9
Smoking		
Yes	65	40.4
No	96	59.6
Have you chronic disease?		
Yes	38	23.6
No	123	76.4
Have you a psychological		
Yes	29	18.0
No	132	82.0
Age (years)		
Median (IQR)	37 (10)	
95 % CI (lower bound- upper	[36-39]	
CAS-SF Score		
Median (IQR)	2 (3)	
95 % CI (lower bound- upper	[2-4]	
VHS Score		
Median (IQR)	32 (10)	
95 % CI (lower bound- upper	[32-34]	
AVS-LF Score		
Median (IQR)	58 (16)	
95 % CI (lower bound- upper	[57-61]	

Of the participants, 35.4% (n=57) stated that they had COVID-19 infection, 87% (n=140) stated that they were vaccinated against COVID-19 (Sinovac= 61; BioNTech= 25; both= 54) and 57.1% stated that they had three doses of vaccination. Only 14.9% (n=24) of the participants with COVID-19 infection stated that they used favipravir, or chloroquine derivatives, while the remaining participants indicated that they resorted to symptomatic treatment options. 19.3% (n=27) of the participants who had the COVID-19 vaccine stated that they got COVID-19 disease after vaccination [Sinovac (n=22; 78.6%), BioNTech (n=4; 14.3%), Both (n=2; 7.1%)].

The rate of participants who were hesitant about childhood vaccine applications was 15.5% (n=25), while the rate of participants who were hesitant about the COVID-19 vaccine was 49.1% (n=79). The rate of participants who think that COVID-19 vaccines are protective is 47.8% (n=77). The first three of the situations that worry the participants the most during the COVID-19 process were listed as their parents contracting COVID-19 (67.1%; n=108), greater uncertainty about COVID-19 (39.8%; n=64), and individual fear of contracting COVID-19 (29.2%; n=47) (Table 2).

Table II: Distribution of various variables of participants related to COVID-19 and Vaccination

Variables	n	%
Exposure to the COVID-19 ?		
Yes	57	35.4
No	104	64.6
Vaccinated against COVID-19?		
Yes	140	87.0
No	21	13.0
Number of COVID-19 vaccine		
1 dose	12	8.6
2 doses	39	27.9
3 doses	80	57.1
4 doses	9	6.4
Hesitancy against childhood vaccines		
Yes	25	15.5
No	136	84.5
Hesitancy against COVID-19 vaccine		
Yes	79	49.1
No	82	50.9
Do you think the COVID-19 vaccine is		
Yes	77	47.8
No	37	23.0
No idea	47	29.2
Should the COVID-19 vaccine be made		
Yes	64	39.8
No	63	39.1
No idea	34	21.1
Which of the following are you most		
My parents' exposure to COVID-19	108	67.1
Uncertainties about COVID-19	64	39.8
Individual exposure to COVID-19	47	29.2
Working in the COVID-19 service	12	7.5
Working in the COVID-19 intensive care	9	5.6

According to the calculations made using the responses of the participants to the CAS, VHS and AVS scales, the median (IQR) CAS-SF score was 2 (3), the median (IQR) VHS score was 32 (10), and the median (IQR) AVS-LF score was 58 (16) (Table-1). COVID-19 anxiety was detected in 16.8% (n=27) of the participants.

Based on the CAS-SF score, the patients were divided into two groups as those with (n=27) and without (n=134) anxiety. There was no statistically significant difference between the groups in terms of age, gender, being vaccinated against COVID-19, hesitation against the COVID-19 vaccine, believing in the protection of the COVID-19 vaccine, and making the COVID-19 vaccine mandatory. On the other hand, there was a statistically significant difference between the groups in terms of education level (p=0.035), hesitation about childhood vaccination applications (p=0.016) and working in COVID-19 units (p=0.044) (Table-3).

Table III: Comparison of COVID-19 Anxiety Status of the Medical Secretaries Participating in the Study by various variables

Variables	COVID-19 related Anxiety			p
	Absence	Presence		
	%	n	%	
Age groups (years)				
≤ 30	12.7	6	22.2	0.425
31-35	24.6	9	33.3	
36-40	32.1	7	25.9	
41-45	15.7	3	11.1	
≥ 46	14.9	2	7.4	
Gender				
Female	59.7	15	55.6	0.853
Male	40.3	12	44.4	
Educational status				
High school	29.9	15	55.6	**0.035**
Assoc graguate	36.6	7	25.9	
Bachelor or postgraduate	33.6	5	18.5	
Vaccinated against COVID-19?				
Yes	85.8	25	92.6	0.532
No	14.2	2	7.4	
Hesitancy against childhood vaccines				
Yes	11.9	9	33.3	**0.016**
No	88.1	18	66.7	
Hesitancy against COVID-19 vaccine				
Yes	49.3	13	48.1	0.999
No	50.7	14	51.9	
Have you worked in COVID-19 Units?				
Yes	3.7	4	14.8	**0.044**
No	96.3	23	85.2	
Do you think the COVID-19 vaccine is protective?				
Yes	46.3	15	55.6	0.509
No	24.6	4	14.8	
No idea	29.1	8	29.6	
Should the COVID-19 vaccine be made mandatory by law?				
Yes	36.6	15	55.6	0.166
No	41.8	7	25.9	
No idea	21.6	4	18.5	

Different groups were formed using some independent variables of the participants and these groups were compared according to their VHS scores, which is a dependent variable. Accordingly, it was determined that age, gender, and educational status variables did not have a statistically significant effect on the median VHS scores. On the other hand, it was shown that independent variables such as the status of being vaccinated against COVID-19 (p=0.014), hesitation against childhood vaccines (p=0.001), the presence of hesitation against the COVID-19 vaccine (p<0.001), belief in the protection of the COVID-19 vaccine (p<0.001) and making the COVID-19 vaccine mandatory (p<0.001) have affected median VHS scores to a statistical significance (Table 4).

Different groups were formed using some independent variables of the participants and whether or not these variables affected the AVS-LF scores, which is a dependent variable, was analyzed. According to this, it has been shown that independent variables such as COVID-19 vaccine status (p=0.002), hesitation against COVID-19 vaccine (p<0.001), belief in the protection of COVID-19 vaccine (p<0.001) and making COVID-19 vaccine mandatory (p<0.001) affect median VHS scores to an extent that it is statistically significant (Table 5).

Table IV: Comparison of VHS Scores of the Medical Secretaries participating in the Study according to various variables

Variables	VHS Scores [Median (95%CI)			p
	Me	Lower	Upper	
Age groups (years)				
≤ 30	29	28	34	0.725
31-35	28	24	30	
36-40	29	27	33	
41-45	27	24	32	
≥ 46	26	24	42	
Gender				
Female	30	30	33	0.124
Male	27	26	30	
Educational status				
High school	27	26	30	0.381
Assoc graguate	28	26	31	
Bachelor or postgraduate	30	27	34	
Vaccinated against COVID-19?				
Yes	27	26	30	0.014
No	31	29	38	
Hesitancy against childhood vaccines				
Yes	33	30	38	**0.001**
No	27	26	30	
Hesitancy against COVID-19 vaccine				
Yes	31	29	34	**<0.001**
No	26	25	29	
Do you think COVID-19 vaccine is protective?				
Yes	24	24	26	**<0.001**
No	36	34	38	
No idea	30	29	34	
Should COVID-19 vaccine be made mandatory by law?				
Yes	24	24	27	**<0.001**
No	33	30	36	
No idea	30	30	32	

Table V: Comparison of AVS-LF scores of the Secretaries participating in the study according to various variables

Variables	AVS-LF Scores [Median (95%CI)			p
	Median	Lower	Upper	
Age groups (years)				
≤ 30	53	51	74	0.559
31-35	52	45	64	
36-40	57	50	64	
41-45	52	51	69	
≥ 46	48	36	63	
Gender				
Female	58	52	65	0.138
Male	52	50	57	
Educational status				
High school	53	51	68	0.155
Assoc graguate	51.5	45	58	
Bachelor or postgraduate	56	50	61	
Vaccinated against COVID-19?				
Yes	52	51	58	**0.002**
No	66	54	76	
Hesitancy against childhood vaccines				
Yes	63	52	74	0.080
No	52	51	58	
Hesitancy against COVID-19 vaccine				
Yes	60	56	66	**<0.001**
No	50	45	52	
Do you think COVID-19 vaccine is protective?				
Yes	47	43	51	**<0.001**
No	66	65	74	
No idea	58.5	52	68	
Should COVID-19 vaccine be made mandatory by law?				
Yes	47	42	52	**<0.001**
No	64	55	68	
No idea	57	51	60	

DISCUSSION

In this Study, COVID-19 vaccination status, anxiety status, vaccine hesitancy levels and affecting factors during the pandemic period of medical secretaries working in the field of health were examined. While the rate of secretaries who had the COVID-19 vaccine in our research group was 87% and the rate of three-dose vaccines was 57.1%, the rate of three-dose vaccine administration in the entire country was 33.2% at the time of this Study[16]. About half of our study group thinks that COVID-19 vaccines are protective. Since the secretaries working in the field of health are at higher risk compared to the society and the rate of thinking that vaccines are protective is higher, they may have been vaccinated at a higher rate than the society.

Among the participants in our study, the rate of hesitation against all vaccines was 15.5%, while the rate of hesitation against the COVID-19 vaccine was 49.1%. In a study conducted with healthcare professionals in the USA (n=10871), it was shown that 7.1% of the participants did

not have their children vaccinated at all, and 50% of the participants had hesitations about the COVID-19 vaccine[17]. In a study conducted with healthcare professionals in France (n=1965), it was shown that 453 (23.1%) people had hesitations about the COVID-19 vaccine, and 76 (3.9%) were against the COVID-19 vaccine[18]. In a population-based study conducted with 1481 people in Mexico, it was stated that 87.8% (1328) of the participants were willing to be vaccinated against COVID-19[19]. In a study conducted with 4571 people in Norway, it was shown that 478 (10.46%) of the participants were hesitant about COVID-19 vaccines, and health sector workers were 0.78 less hesitant about vaccination[20]. In a study conducted in China with the participation of 29,925 people, it was stated that 2514 (8.40%) participants had hesitations about the vaccine in the first vaccination, while 2510 (8.39%) people were hesitant about re-administration of the COVID-19 vaccine[21]. In a study conducted with medical students (168 people) in Michigan, USA, 37 students were shown to be hesitant about COVID-19 vaccines[22]. Although about half of our study group had hesitations about the COVID-19 vaccine, high vaccination rates may have been achieved due to the fact that the most worrying situations for them individually are the unknowns about COVID-19, the fear of contracting COVID-19 individually and the thought that vaccines have a high level of protection.

Similarly in our study group, the median of VHS Scale and AVS total score was high. For this reason, it is important in terms of individual and community immunity to examine the vaccine rejection or hesitancy situation against COVID-19 vaccines in detail just as in childhood vaccines and adult vaccines, and to intervene in this direction. In order to achieve high vaccination rates, it is important to identify the causes of hesitation, to provide satisfactory and explanatory information transfer, to organize trainings and to make strategic interventions.

In our study, COVID-19 anxiety was detected in 16.8% of participants. There was no significant difference between the presence of COVID-19 anxiety according to age group, gender, COVID-19 vaccination status, and COVID-19 vaccine hesitancy, and a significantly lower rate of anxiety was found in the high school and lower education group. In addition, the rate of anxiety was found to be higher in participants who were hesitant about all vaccines. In a study conducted with healthcare workers (n=221) in Turkey, it was shown that 35.2% of the medical secretaries (n=70) had depression and 25.7% had anxiety during the COVID-19 period and anxiety and depression scores of nurses and medical secretaries were found to be significantly higher than physicians. When we look at all the participants, the hospital anxiety and depression scale scores were found to be significantly higher in women who did not have a master's or doctorate education, were single and did not have children[23]. In another study conducted with healthcare professionals (n=1015) in Turkey, 34.9% of the participants showed high levels of depression and 31.9% of them had high anxiety[24]. In the analysis of a research that included 17 studies, the prevalence of anxiety among personnel dealing with patients was shown as 27%[8]. In a study conducted with 1406 healthcare workers in Switzerland, it was stated that 364 people (25.9%) had symptoms of anxiety and 290 people (20.6%) had symptoms of depression, and it was shown that there were more symptoms in frontline healthcare workers who were exposed to COVID-19 patients than those who were not exposed[25]. In our study group, a higher rate of COVID-19 anxiety was found in participants working in the intensive care unit. A meta-analysis covering 7 studies showed that the prevalence of anxiety and depression among healthcare workers during the COVID-19

pandemic was 24.9% and 24.8%, respectively[26]. As shown in other studies similar to our Study, being in close contact with COVID-19 patients and working in the hospital may have increased anxiety, especially in people working in the health sector. Making remedial interventions to reduce the existing anxiety, stress and depression rates, and developing therapeutic psychiatric services can have a positive effect on the mental health and work performance of healthcare workers.

In our study, the first of the situations that worried the secretaries participating in the study during the COVID-19 period was their parents contracting COVID-19 (67.1%), and similar to ours, in a study conducted with 600 healthcare workers in Turkey, it was shown that 95.3% of the participants had the fear of infecting their loved ones with the COVID-19[27]. During the pandemic process, it is seen that healthcare professionals experience a high level of anxiety about transmitting this infection to their families, as well as the anxiety of contracting the infection.

In our study, no difference was found between the median score of the VHS according to age group, gender, and educational status, while the median score of the VHS of those who did not think that the COVID-19 vaccine was protective was found to be significantly higher compared to those who did. In this Study, it was seen that having correct information about vaccination affected the hesitation scale score. For this reason, it can be seen that the rate of hesitation increases in those who do not have enough information about vaccines and vaccination, and who are exposed to false and incomplete information about the protection of vaccines. Providing effective information in this direction with correct and valid scientific publications can reduce the rate of hesitation in secretaries working in the field of health.

CONCLUSION AND RECOMMENDATIONS

• Bearing the period in which the study was conducted in mind, it was observed that the vaccination rate was high in the participants, but the third dose vaccination rate was lower than expected. Raising awareness by using effective seminars and promotional brochures in health institutions can increase vaccination rates.

• Although all of the participants worked in a health institution, it was determined that there was a high rate of hesitation against both childhood vaccinations and specifically COVID-19 vaccination programs. The most important reason for this negative approach is the negative news about vaccines in mass media and social media, especially during the COVID-19 process. It can be recommended for mass media to make programs within the framework of responsible broadcasting, but this is not possible in social media. Therefore, it is important to organize effective meetings and programs under the leadership of competent and independent scientists in terms of raising awareness in the society.

• The level of anxiety associated with COVID-19 was found to be 3.7 times (95% CI = 1.40 - 9.60) higher in participants who were hesitant about childhood vaccinations than in participants without such hesitation. However, there was no difference in the anxiety levels associated with COVID-19 between the participants with and without hesitation about the COVID-19 vaccine. This result is difficult to explain, therefore this question can be answered with data from multicentre studies with more participants.

• It was determined that the level of anxiety related to COVID-19 in the participants working in COVID-19 clinics was 4.5 times (95% CI = 1.12-17.97) higher than the participants working in other clinics. In order to solve this problem, it can be recommended to rotate the staff working in COVID-19 clinics, to provide satisfactory training support on personal

hygiene and protection methods, and to motivate them with promotions.

• The anxiety level associated with COVID-19 in high school graduates was found to be 2.9 times (95% CI= 1.26- 6.83) higher than individuals with an associate degree or higher education level.

• In the correlation analysis based on the scores obtained from the AVS and VHS scales, a statistically significant, positive and moderately strong relationship was found between the answers given to these two scales ($r=0.457$, $p<0.001$). This result shows that there is a parallelism between the participants' perceptions of vaccine hesitancy and anti-vaccination.

• Providing information on the importance of vaccination to protect against COVID-19, the protective effect of using personal protective equipment correctly and effectively, diagnosis and treatment processes of the disease and prevention of infection and providing in-house intermittent training if necessary can both help reduce vaccine hesitancy, reduce the occurrence of COVID-19 anxiety, and reduce existing anxieties in secretaries.

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