Original Research Article

Nursing students' perception of the covid-19 disease and attitudes toward vaccination

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Abstract

Background: The COVID-19 is globally the most critical public health concern of our age. Raising awareness in fighting pandemics, society's perception of COVID-19 in acquiring herd immunity in society, attitudes toward vaccines, and the role of health-care professionals in vaccine acceptance is all important.

Aim: This study aimed to determine nursing students' perceptions of the COVID-19 disease and attitudes toward the COVID-19 vaccine.

Materials and methods: This cross-sectional study was conducted with 263 nursing students between December 2021 and April 2022. Data were collected using the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine Scale.

Results: The nursing students had high levels of perceptions of COVID-19 and positive attitudes toward the COVID-19 vaccine. Based on the subscales, the nursing students had high scores in the dangerousness and infectious subscales regarding their perception of the disease. In addition, they had higher scores in the positive subscale than in the negative subscale concerning their attitudes toward the COVID-19 vaccine.

Conclusion: Results of this study, planned training programs should be organized, curricula should be revised to help nursing students in order to be prepared for the future pandemics.

Key words

Perception of the COVID-19 disease, COVID-19 vaccine, Attitude, Nursing student.

Introduction

Hand washing, the use of alcohol-based solutions for hands, avoiding touching surfaces, social distancing, the use of masks, and vaccination play key roles in preventing the occurrence and spread of the COVID-19 disease. Studies demonstrating the safety and effectiveness of

vaccines are important in gaining the trust of society. There are studies that reveal the requirement for further data and evidence regarding vaccine hesitancy and conspiracy theories [1, 2, 3, 4].

Nurses have made enormous contributions to the fight against the COVID-19 pandemic on the front line and play a key role in developing positive attitudes toward the COVID-19 vaccine, acquiring herd immunity in society, raising awareness of society, and vaccine acceptance. The results of this study are expected to be a guide in the fight against the COVID-19 pandemic and in being prepared for future pandemics by helping nursing students develop positive attitudes in society toward vaccination, revision of curricula, and building new strategies.

Materials and methods

This cross-sectional study was conducted with 263 students who were in their first, second, third, and fourth years in the Department of Nursing in the Faculty of Health Sciences of a university located in the western part of Türkiye and volunteered to participate in the study between December 2021 And April 2022. The data were collected using the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine Scale developed by [5]. The Cronbach's alpha coefficient of the COVID-19 Disease Perception Scale (P-COVID-19) was 0.749 whereas that of the Attitudes toward the COVID-19 Vaccine Scale (ATV-COVID-19) was 0.801. The data were collected following the pandemic rules.

The data obtained in the study were evaluated through SPSS 19.0 (Serial no.: IBM SPSS Statistics for Windows, Version 19.0. Armonk, NY: IBM Corp.). The data were evaluated using Kolmogorov-Smirnov, chi-square, ANOVA and t-tests, and the p value was accepted as 0.05 for statistical significance. Permission had been obtained from the Health Sciences Scientific Research Ethics Committee (Protocol No.: 210027, 11.12.2021), the Dean's Office of the

Faculty of Health Sciences, the authors of the COVID-19 Disease Perception Scale and the Attitudes Toward the COVID-19 Vaccine Scale, and the nursing students before the study was conducted.

Results

This study aimed to determine nursing students' perception of the COVID-19 disease and their attitudes toward vaccination. In the study, 52.10% of the students were aged 20 and 21, 66.70% were female, and 77.40% lived in an urban region. Of the participants, 76.40% had nuclear families, 44.40% had equal income and expense levels, 93.10% did not have a chronic disease, and 21.10% smoked tobacco, hookah or cigarettes (**Table - 1**). Of the nursing students, 55.80% thought that they were at risk due to COVID-19, 90.40% had intentions to get vaccinated and 81.20% believed that the vaccine protected against the disease. Of them, 93.50% used social media as a source of information, and 43.70% considered social media to be reliable (**Table - 2**). In this study, 24.50% of the nursing students preferred domestic vaccines while 80.50% preferred imported vaccines. The students' vaccine preferences/vaccination was affected by health-care staff (73.60%), family (53.30%), and instructors at the university (43.30%) respectively. They were affected the least by social media influencers (6.10%) and popular people (7.30%) (**Table - 3**). The methods of protection against COVID-19 applied by the nursing students included the use of masks with a rate of 95.00%, hand washing, the use of disinfectants, and social distancing (**Table - 4**). **Table - 5** included a comparison of certain socio-demographic characteristics of the participants and their methods of protection against COVID-19 and indicated that there were differences in the use of disinfectants and social distancing practices based on gender, and also in the uses of masks and glasses, vaccine, and social distancing practices based on family type. Furthermore, regarding the nursing students' vaccine and vaccination preferences, there were differences between the effects of university instructors

based on their study year, between the effects of social media influencers based on the high school from which they graduated, and between the other effects based on family type ($p < 0.05$).

Table – 1: Socio-demographic characteristics of Nursing Students (n: 263).

Socio-demographic characteristics	n	%
Age (Mean ± Sd 20.51 ±1.69 Min. 18 Max: 30)		
18-19	67	25.70
20-21	136	52.10
22 and upper	58	22.20
School Grade Level		
1st Year	66	25.30
2nd Year	63	24.10
3rd Year	66	25.30
4th Year	66	25.30
Gender		
Female	174	66.70
Male	87	33.30
Graduated High School		
Health Vocational High School	18	6.90
Industrial Vocational High School	3	1.20
Anatolian High School	211	80.90
Science High School	24	9.30
Other*	4	1.60
Living place		
Rural	59	22.60
Urban	202	77.40
Living With		
Family	31	11.90
Friend	157	60.20
Relative	6	2.30
Alone	29	11.10
Other**	38	14.60
Family Type		
Nuclear family	199	76.40
Extended family	54	20.90
Broken family	4	1.80
Nomadic family	2	0.90
Economic Status		
Income lower than the expense	107	41.00
Income is equal to the expense	116	44.40
Income higher than the expense	38	14.60
Chronic Disease		
Yes	18	6.90

No	243	93.10
Status using Tobacco- Hookah- Cigarette		
Yes	55	21.10
No	206	78.90

*Religious High School, Private High School,   **Boarding House vb.

Table – 2: Distribution of Nursing Students Opinions related to COVID-19 and Vaccine.

Considerations	Yes		No	
	n	**%**	**n**	**%**
State of supposing to be at risk due to COVID-19	143	55.80	113	44.20
State of getting COVID-19 test	140	53.60	121	46.40
State of using social media as a source of information	244	93.50	17	6.50
State of regarding social media as a reliable source	114	43.70	146	55.90
State of getting flu vaccine	86	33.00	174	67.00
State of the presence of someone vaccinated in the family	228	87.40	33	12.60
State of believing that the vaccine protects against diseases	207	81.20	48	18.80
State of having an intention to get vaccinated	236	90.40	25	9.60
State of wishing to be informed about vaccines	175	67.00	86	33.00
State of considering vaccines to be safe	169	64.80	92	35.20

Table – 3: COVID-19 Vaccine Preferences of Nursing Students and Distribution of People Affecting Vaccine Preference and Vaccination.

Preference of Vaccine Type	Yes		No	
	n	**%**	**n**	**%**
Local vaccine	64	24,50	197	75,50
Imported vaccine	210	80,50	51	19,50
Better efficacy and quality Vaccine	20	7,70	241	92,30
Who can have an Prefer and effect on vaccination				
Social media influencers	16	6,10	245	93,90
Health Workers	192	73,60	69	26,40
Peer/ friend	96	36,80	165	63,20
Family	139	53,30	122	46,70
Popular people	19	7,30	242	92,70
University lecturer	113	43,30	148	56,70
Other*	27	10,30	234	89,70

*Relative, imperative conditions, etc.

Table – 4: Which protective measures are used for COVID-19 By Nursing Students.

Protective Measures	Yes		No	
	n	**%**	**n**	**%**
Mask	248	95,00	13	5,00
Goggles	18	6,90	243	93,10
Disinfectant	209	80,10	52	19,90
Vaccine	211	80,80	50	19,20
Social Distance	222	85,10	39	14,90

Face Shield	42	16,10	219	83,90
Hand Washing	230	88,10	31	11,90
Supplements (Vitamins, drugs, etc.)	81	31,00	180	69,00
Other*	2	0,80	259	99,20

*Stay home, isolation, etc.

Table – 5: Comparison of Some Demographic Characteristics of Nursing Students with COVID-19 Protective Measures and people who are preferring and affecting on COVID-19 vaccination.

	Class	Gender	Graduated High School	Living Place	Living With	Family Type	Economic status
Protective Measures							
Mask	0,34	0,10	0,18	0,33	0,23	**0,02**	0,58
Goggles	0,71	0,10	0,86	0,62	0,39	**0,02**	0,19
Disinfectant	0,79	**0,02**	0,12	0,53	0,34	0,29	0,52
Vaccine	0,94	0,06	0,77	0,32	0,25	**0,01**	0,95
Social Distance	0,44	**0,01**	0,87	0,13	0,61	**0,01**	0,79
Face Shield	0,43	0,30	0,44	0,35	0,90	0,11	0,27
Hand Washing	0,49	0,19	0,62	0,13	0,84	0,28	0,95
Supplements (vitamins, drug, etc.)	0,23	0,16	0,38	0,47	0,26	0,80	0,71
Other*	0,56	0,56	0,40	0,05	0,85	0,96	0,28
Affecting People							
Social media Influencers	0,68	0,26	**0,01**	0,04	0,22	0,70	0,18
Health Workers	0,11	0,15	0,73	0,24	0,34	0,13	0,70
Peer/ Friend	0,31	0,07	0,15	0,29	0,36	0,20	0,26
Family	0,33	0,23	0,77	0,39	0,70	0,20	0,73
Popular People	0,91	0,06	0,40	0,44	0,84	0,85	0,38
University Lecturers	**0,00**	0,28	0,15	0,38	0,61	0,46	0,11
Other**	0,42	0,41	0,60	0,41	0,58	**0,03**	0,85

**Stay home, isolation, etc. *Relative, imperative conditions, etc.

Table – 6: Distribution of Total Mean Scores and Subscale Mean Scores of the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine Scale.

Scales and Subscales	Mean ± SD	Min – Max
COVID-19 Disease Perception Scale	26,45 ± 4,85	13 – 35
Dangerousness	11,32 ± 2,39	3 – 15
Infectious	15,13 ± 3,45	4 – 20
Attitudes Toward the COVID-19 Vaccine Scale	31,29 ± 6,01	9 - 45
Positive Attitudes	14,56 ± 3,63	4 – 20
Negative Attitudes	16,73 ± 3,93	5 – 25

Table - 6 shows that the nursing students had high scores in the dangerousness and infectious subscales regarding their perception of the disease. In addition, they had higher scores in the positive subscale than in the negative subscale concerning their attitudes toward the COVID-19

vaccine. A positive, significant relationship was found between the subscales of the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine.

Table – 7: Evaluation of the Relationship between the COVID-19 Disease Perception Scale and the Attitudes Toward the COVID-19 Vaccine Scale As Well As The Relationship Between Their Subscales.

		Perception	Dangerousness	Infectious	Attitudes	Positive	Negative
Perception	**r**	1	0.746	0.887	0.257	0.273	0.141
	p		**0.000***	**0.000***	**0.000***	**0.000***	**0.022***
Dangerousness	**r**		1	0.354	0.253	0.166	0.234
	p			**0.000***	**0.000***	**0.007***	**0.000***
Infectious	**r**			1	0.186	0.268	0.037
	p				**0.003***	**0.000***	0.555
Attitudes	**r**				1	0.776	0.812
	p					**0.000***	**0.000***
Positive	**r**					1	262
	p						**0.000***
Negative	**r**						1
	p						

r = Pearson Correlation Coefficient, *p<0,05

Table – 8: Comparison of Certain Socio-demographic Characteristics with the Subscales of the COVID-19 Disease Perception Scale and Attitudes toward the COVID-19 Vaccine Scale.

Characters	COVID-19 Disease Perception Subscale				Attitudes Toward the COVID-19 Vaccine Subscale			
	Dangerousness		Infectious		Positive		Negative	
	Mean± SD	Test statistic	Mean± SD	Test statistic	Mean± SD	Test statistic	Mean± SD	Test statistic
Class								
1st	11.40 ± 2.42	F= 1,266 p=0.287	15.11±3.91	F= 0,880 p= 0.452	15.14±3.68	F= 2,611 p= 0.052	16.85±4.34	F= 0,184 p= 0.907
2nd	11.54 ± 2.36		15.21±2.77		14.05±3.53		16.95±3.43	
3rd	10.83 ± 2.36		14.62±3.85		13.83±4.03		16.48±3.81	
4th	11.51 ± 2.42		15.59±3.12		15.21±3.08		16.64±4.11	
Total	11.32 ± 2.39		15.13±3.45		14.56±3.63		16.73±3.93	
Gender								
Female	11.74 ± 2.14	**t= 4,064 p= 0.000**	15.56±3.22	**t= 2,890 p= 0.04**	14.85±3.34	t= 1,816 p= 0,071	17.19±3.71	**t= 2,720 p= 0,007**
Male	10.49 ± 2.66		14.26±3.74		13.99±4.11		15.80±4.20	
Graduated High School								
Health Vocational High School	11.39±3.09	F= 0,1,261 p= 0.286	15.72±2.47	F= 0,440 p= 0,779	14.61±3.15	F=1,815 p= 0.126	17.00±3.45	F= 0,525 p= 0,718

Industrial Vocational High School	11.67±1.15		15.67±3.21		9.67±8.96		15.33±3.05	
Anatolian High School	11.22±2.36		15.07±3.48		14.54±3.63		16.78±3.99	
Science High School	12.00±2.06		15.46±3.41		15.50±2.59		16.83±3.97	
Other *	13.25±1.71		13.50±6.81		15.00±3.83		14.25+2.99	
Total	11.34±2.38		15.13±3.46		14.59±3.61		16.75±3.92	
Living place								
Rural	11.52±2.81	t= 0,742 p= 0,459	15.30±3.49	t= 0,442 p= 0,659	14.27±3.67	t= -0,702 p=0,484	17.15±4.27	t= 0,944 p= 0,346
Urban	11.26±2.26		15.08±3.45		14.65±3.62		16.60±3.82	
Living with								
Family	11.67±2.89	F= 0,464 p= 0.762	15.68±2.30	F= 1,665 p= 0,159	14.35±4.33	F= 0,511 p= 0.727	16.46±3.99	F= 1,482 p= 0.208
Friend	11.16±2.29		14.92±3.62		14.39±3.63		16.44±3.97	
Relative	11.67±2.66		13.17±4.79		16.00±3.41		15.83±2.32	
Alone	11.41±2.26		14.79±3.49		14.86±3.30		18.21±3.75	
Other**	11.55 ± 2.49		16.10±3.13		14.97±3,36		17.16±3.90	
Total	11.32±2.39		15.13±3.45		14.56±3,63		16.73±3.93	
Family Type								
Nuclear	11.44±2.38	F=1,052 p= 0.370	15.35±3.24	**F= 3,383 p= 0,019**	14.80±3.42	**F= 3,459 p= 0,017**	17.00±3.78	**F= 4,224 p= 0,006**
Extended	10.81±2.45		14.54±3.63		13.65±3.88		15.48±3.86	
Broken	10.75±2.50		14.50±7.14		10.75±6.18		19.00±4.90	
Nomadic	11.50±0.71		8.50±6.36		17.50±3,53		11.00±2.83	
Total	11.30±2.39		15.11±3.46		14.52±3.61		16.67±3.88	
Economic Status								
Income lower than the expense	11.10±2.39	F=0,757 p= 0.470	14.94±3.67	F= 0,478 p= 0,621	14.18±3.96	F= 1,391 p= 0,251	16.16±3.72	F= 2,227 p= 0,110
Income is equal to the expense	11.47±2.38		15.15±3.52		14.97±3.24		16.98±4.17	
Income higher than the expense	11.47±2.48		15.58±2.51		14.39±3.75		17.55±3.55	
Total	11.32±2.39		15.13±3.45		14.56±3.63		16.73±3.93	

*Religious High School, Private High School,   **Boarding House vb.

In **Table - 7**, there was a positive, significant relationship between the subscales of the COVID-19 Disease Perception Scale and those of the Attitudes toward the COVID-19 Vaccine Scale (p < 0.005) while there was a positive but insignificant relationship between the infectiousness subscale of the COVID-19 Disease Perception Scale and the negative subscale of the Attitudes Toward the COVID-19 Vaccine Scale (p< 0.05). **Table - 8** indicated a significant relationship between gender and the dangerousness and infectiousness subscales of the COVID-19 Disease Perception Scale and between family type and the infectiousness subscale. In addition, the study found significance between gender and the negative subscale and between family type and the positive and negative subscales based on the Attitudes toward the COVID-19 Vaccine Scale (p < 0.05). No statistically significant difference was found between the total and subscale scores of the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine Scale in terms of the study year, the high school from which the students graduated, place of residence, people lived with, and income level (p> 0.05).

Discussion

In this study, 6.90% of the nursing students had a chronic disease (**Table - 1**). As is known, chronic diseases are slowly progressing perpetual illnesses that require continuous follow-up, medication intake and checks and affects the quality of life of the relevant person. Chronic diseases formed a basis that increased their epidemic effects during the COVID-19 pandemic [6]. There are studies that indicate a relationship between the COVID-19 infection and diabetes, and severe cardiovascular diseases [7, 8, 9]. Similarly, conducted a study with patients diagnosed with COVID-19 and found that 51% of the patients had at least one chronic disease, such as diabetes, or cardiovascular or cerebrovascular diseases [10]. Another study conducted in China showed that the rates of

mortality due to COVID-19 were higher in patients with hypertension [11].

The study found that 21.10% of the students smoked tobacco, hookah or cigarettes (**Table - 1**). The use of cigarettes and tobacco products is one of the changeable risk factors forming a basis for the occurrence of many fatal diseases. The risk for COVID-19 disease is reported to almost double in active smokers [12]. Nguyen, et al. [13] stated that the fear of COVID-19 increased as the health literacy level decreased, and also that the smoking habit increased in students with high levels of fear. This case implies that individuals with a chronic disease who continuously take medications and smoke are at more risk in terms of COVID-19 than other individuals. Therefore, programs for smoking cessation should be developed for nursing students, who play important roles in protecting and improving community health.

In the study, 55.80% of the students thought they were at risk due to COVID-19, 90.40% had intentions to get vaccinated and 81.20% believed that the vaccine protected against the disease (**Table - 2**). The rapid spread of the COVID-19 disease in society causes all individuals to be at risk. Studies found that 44.91% of individuals considered the people they lived with to be at risk of COVID-19, 94.91% are concerned about having a family member infected with COVID-19 [14] and 43% found themselves to be at risk of COVID-19 [15]. Yoda and Katsuyama [4] revealed that most individuals considered vaccines to be an effective and powerful instrument that is protective for themselves and the people around them. Synnott [16] and Barello, et al. [17] found that most university students considered getting coronavirus vaccine, some did not consider or were not sure about getting vaccinated. Adıbelli and İlaslan [18] reported that one of the reasons why nursing students did not get vaccinated was vaccine effectiveness. On the other hand, Wang, et al. [19] found that 89.5% of the individuals considered vaccines to be effective in protection against COVID-19, and slightly more than half of

the individuals wanted to get vaccinated as soon as possible.

Similarly, Ezati, et al. [20] conducted a study in Iran and found the rate of those who were willing to get the COVID-19 vaccine when their turn came was 78%. The results of this study and the relevant literature indicate that the group who were not sure about getting vaccinated to acquire herd immunity was more likely to be persuaded. Policies should be established and used in addition to discovering effective and reliable vaccines to overcome being at risk in terms of spreading the virus and having contact with the patient even immunity against the virus is acquired, hesitations in vaccination and the fact that some members of society are not open to vaccination. Open communication and persuasive evidence regarding vaccine safety require extremely important studies. Successful application and acceptance of vaccines in society are also considerably affected by attitudes toward vaccines in society [21].

Today anti-vaccination signalizes a critical problem due to becoming more popular worldwide and having potentially destructive effects on community health. Therefore, it is known that countries make attempts on improving vaccination practices throughout the world [22]. The COVID-19 pandemic demonstrated the importance of vaccines once more. To bring the pandemic under control all over the world, effective and reliable vaccines should be developed, and vaccines should be accessible and applied to society in line with scientific and ethical principles [23].

Among the nursing students, 93.50% (244 people) used social media as a source of information about COVID-19 and vaccines and 43.70% (114 people) found social media to be reliable (**Table - 2**). Although social media was not considered to be a reliable source during the pandemic, it was preferred as a source of information, which was an important finding of the study. It is of vital importance to refer to reliable sources while performing a search on the internet to get information about vaccination. For university students who embrace the digital era, sources of information about COVID-19 and their trust in these sources play an important role in shaping their acceptance of getting vaccines [24]. Media can play an important role in decreasing anxiety and fear, improving information, and raising awareness in society in times of crisis [25]. Ezati, et al. [20] pointed out those individuals who used social media as a source of information about vaccines had high levels of intention to get vaccinated. The fact that the participants followed the developments through the media showed the importance of the media's potential of being effective during the epidemic once more. During the critical pandemic period, attention should be paid to the posts and materials to be shared on social and traditional media, and the possible impact of sharing such content on community health should be thoroughly considered. The intense use of social media in obtaining information has demonstrated the necessity of careful follow-up of social media platforms to ensure that they do not provide incorrect and unreliable information. Reaching large audiences in a short time through social media channels is undoubtedly critical in the spread of information. Considering the characteristics of Generation Z and the fact that the current university students are Generation Z members, socializing through the internet, getting information quickly, and using social media as a source of information about current affairs are extremely usual for this generation. Social media's role in individuals' and society's decisions about vaccination has not been fully understood yet. The content of social media should be better monitored for attitudes toward vaccines and for the effect of online social networks on both adults and children and in different social networks. In this respect, planned training programs and campaigns should be carried out, public service announcements and posters should be prepared, and leaflets should be distributed to inform society about accurate and reliable sources of information. Moreover, community-based studies should be conducted

and different strategies should be developed in line with the information requirement of society.

Among the nursing students, 24.50% preferred domestic vaccines while 80.50% preferred imported vaccines. The study examined the people who affected the students' vaccine preferences/vaccination and found that the students were affected the most by health-care staff (73.60%), family (53.30%) and university instructors (43.30%) respectively. They were affected the least by social media influencers (6.10%) and popular people (7.30%) (**Table - 3**). In previous studies, 63.9% [26], almost half Lin, et al. [27] and 32.5% of the participants preferred domestic vaccine [19] while 3.3% preferred imported vaccine and 62.2% preferred both types of vaccines. Religion, bias against foreign vaccine production, information pollution, cultural factors and nationalist feelings are thought to be effective in vaccine preference. Health-care professionals can play an important role in protecting against infections and preventing infectious diseases, convey messages about the benefits of vaccines and provide individuals with information about vaccines in a reliable and prestigious way so that they can relieve their concerns about recently developed vaccines. Open communication and persuasive evidence regarding vaccine safety require extremely important studies. Therefore, nurses have been on the front line in the fight against the epidemic. As reported by a study, the majority of the participants stated that doctor recommendation was important in vaccination [19]. To ensure the success of vaccination programs across the country, it is important to primarily raise the consciousness and awareness of health-care professionals and increase their rates of vaccination. It has been stated that vaccination activities should be performed at hospitals and family health centers, which is important for students to recognize these institutions in terms of cold chain and trust. Although there are potential reluctance and hesitation in vaccination, consultancy on vaccines' benefits, risks, and safety to be given to individuals by health-care providers including

nurses is the most reliable and effective way in making decisions on vaccination [28, 29]. In addition, health-care professionals who have been vaccinated or consider being vaccinated are more likely to recommend vaccination to individuals they provide care for [28]. The majority of the participants considerably trusted scientists, health-care providers and health-care institutions. High level of trust in mass media, health-care facilities, scientists, and pharmaceutical companies is important in increasing the acceptance of the COVID-19 vaccine [24]. The relevant literature has shown that the participants' sources of information about COVID-19 and vaccines included friends, doctors, mass media, such as television, newspaper, journals/magazines and radio, scientific websites, articles, discussion programs, Ministry of Health, the World Health Organization website, internet, electronic news websites, clinical guidelines, and social media instruments, such as Twitter, Facebook, Youtube, Instagram, Snapchat and WhatsApp [1, 14, 15, 19, 24, 25, 30, 31, 32]. Almost 81.8% of male students and 75.5% of female students used social media as a source of information [30]. As reported by Taneri [15] 45% of the medical faculty students considered that the media made the epidemic look worse than it had actually been, and the students who had the nationality of the Republic of Türkiye trusted the information and epidemic management processes of the WHO and the Ministry of Health significantly less than the foreigners did. The fact that individuals had low levels of trust in the information and epidemic management carried out by international and national health authorities should be evaluated by the relevant institutions and they should share data with society in a faster and more trustable manner to change this situation. Health-care professionals equipped with accurate and updated information are able to provide such information.

The methods of protection used by the nursing students against COVID-19 included the use of masks with the highest score 95.00%, which was followed by hand washing, social distancing, the

use of disinfectants, vaccines, auxiliary and supportive practices (medications, vitamins, etc.), and the use of glasses and visors respectively (**Table - 4**). The use of masks, social distancing, avoiding crowded environments, hand washing, and vaccination were the leading methods used for being protected against COVID-19 [33]. The relevant studies reported that individuals maintained social distancing, wore masks and gloves, cleaned their hands with soap and hand disinfectants, washed everything coming into contact with the outer environment, consumed much liquid, used cologne, aired the environment, and avoided public space and crowded places to be protected against the disease [15, 19, 24, 25, 34].

Öncü, et al. [35] stated that two out of every three participants believed that masks, distancing, and hand washing would completely protect from the disease, and Nadeem and Khaliq [25] reported that over 63% of the individuals maintained social distancing in workplaces and offices or bazaars, etc., 75.4% wore masks and gloves, and 85.6% washed their hands with soap and hand disinfectants. This result demonstrates that students who considered themselves to be at risk acted responsibly toward performing measures of protection while it implies that those who did not consider themselves to be at risk can behave in a flexible manner in performing such measures. It has been reported that physical distancing experienced during this period may cause individuals to have feelings such as grief, anxiety, and chronic stress in the long term [34]. Although vitamin D supplements have positive effects on viral infections including influenza and HIV, the effects of vitamin D support during the COVID-19 infection are controversial. This situation indicates the necessity of more comprehensive studies on this issue [36]. It is extremely important for students to perform the recommended precautions in the fight against the pandemic and in bringing the disease under control. Planned training programs to be conducted accordingly are supposed to make significant contributions to the protection against

the disease and to the increase in the level of health literacy.

The study examined the comparison of certain socio-demographic characteristics of the participants and the methods of protection against COVID-19, and found differences between the use of disinfectants and social distancing practices based on gender and between masks, glasses, vaccines and social distancing practices based on family type. The study also found differences between the effects of university instructors based on the study year of the participants and between the effects of social media influencers based on the high school from which they graduated (**Table - 5**). The main purpose is to primarily avoid contracting COVID-19 during the pandemic process. Therefore, many precautions have been taken to ensure protection and minimize infection. As the disease is infected through contact, regular cleaning and disinfection of frequently contacted surfaces, leaving a distance of at least 1.5−2 meters between individuals, and avoiding close contact in society are important in being protected against the COVID-19 infection [37]. While implementing such mass measures, society's awareness of the severity of the COVID-19 disease and collaboration with individuals in society are extremely important in reducing further spread of the disease. The difference based on gender may have been caused by the fact that women are mostly at home and responsible for cleaning chores in the Turkish society, and the reason for the difference between the uses of masks and glasses, social distancing, and vaccination practices based on family type can be explained by intra-family interaction and social learning.

The descriptive statistical results of the Total and Subscale Scores of the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine Scale showed that Based on the subscales, the nursing students had high scores in the dangerousness and infectious subscales regarding their perception of the disease. In addition, they had higher scores in the

positive subscale than in the negative subscale concerning their attitudes toward the COVID-19 vaccine. A positive, significant relationship was found between the subscales of the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine Scale (**Table - 6**).

During the pandemic period, the effective implementation to protect the health of the whole society bringing the increased numbers of morbidity and mortality under control is vaccination [38]. A study conducted with nursing students found that students' attitudes toward the COVID-19 disease were moderate (unstable) [39]. Another study found that doctors/nurses had more significant and higher scores in positive attitudes toward the COVID-19 vaccine compared to the other health-care staff [26]. In this respect, protective measures should be implemented and immunity should be acquired in the long term to end the pandemic, and society should be informed about the reliability, protectiveness and content of the COVID-19 vaccine to minimize the harm to society. Individuals should be informed about the measures to be taken to protect themselves and their families against the disease by updated and reliable sources, and they should be enabled to develop positive attitudes toward the vaccine. To help individuals gain positive attitudes toward vaccines, studies including the proven vaccine effectiveness in the fight against infectious diseases in the past can be shown as an example, individuals can be supported to express their vaccine hesitancy easily, details of the development stages of vaccines can be shared with individuals, and studies on evaluating attitudes toward vaccines can be conducted.

The study found a positive, significant relationship between the nursing students' subscale scores of the COVID-19 Disease Perception Scale and the Attitudes toward the COVID-19 Vaccine Scale (p < 0.05). There was no significant relationship between the infectiousness subscale of the COVID-19 Disease Perception Scale and the negative subscale of the Attitudes Toward the COVID-19 Vaccine Scale (p > 0.05) (**Table - 7**). This implies that nursing students are aware of the importance of vaccination in the fight against epidemics as health-care professionals of the future and have the consciousness of health-care staff in the fight against future pandemics as well as professional consciousness in raising awareness of society. Furthermore, students are of the opinion that epidemics can be brought under control through vaccines, which indicates that they would put themselves in a key position in the protection of community health, improvement of the quality of care, and direction of individuals. Being of that opinion will undoubtedly make major contributions to fighting the current pandemic and acquiring herd immunity in society.

This study found significance between the dangerousness and infectiousness subscales of the COVID-19 Disease Perception Scale based on gender and in the infectiousness subscale of the same scale based on family type. It also found significance in the negative subscale of the Attitudes toward the COVID-19 Vaccine Scale based on gender and in the positive and negative subscales of the same scale based on family type (p < 0.05). However, no statistically significant difference was found between the total and subscale scores of the COVID-19 Disease Perception Scale and the Attitudes Toward the COVID-19 Vaccine Scale based on the study year, the high school from which they graduated, place of residence, people to be lived with, and income level (p > 0.05), (**Table - 8**).

These findings show that individuals had high scores in performing precautions for the disease regarding their COVID-19 perception and also in their attitudes and tendencies toward vaccines irrespective of study year, the high school from which they graduated, place of residence, people they lived with, and income level variables. However, the significant difference based on gender in this study implies that the female students were more careful about the COVID-19 disease and had a higher tendency to protect the people around them and adopt the rules compared to the male students. Women were reported to have higher levels of anxiety about health than

men in case of an epidemic [40]. Bali, et al. [41] reported that women had higher, statistically significant scores on being protected against diseases. Similar studies were examined, and Schwarzinger, et al. [42] found in the model they used in their study that vaccine refusal and vaccine hesitancy were significantly related to females, age, low level of education, and those who were not compliant with the vaccines recommended in the past and did not report a specific chronic state. In a study with a similar topic, Taneri [15] reported that there was a significant difference between considering getting vaccinated and age, gender and study year. In addition, significance was found between family type and the positive and negative subscales of the Attitudes toward the COVID-19 Vaccine Scale (p < 0.05). As it is known, family is one of the most powerful structures in the development and maintenance of a society. Family meets the physiological and psychological needs of all family members and becomes role models for children. Therefore, the significance regarding the infectiousness subscale of the COVID-19 Disease Perception Scale based on family type can be explained by intra-family communication. Furthermore, a high level of risk of disease infection among family members may increase the level of the infectiousness subscale of the disease perception scale. Moreover, there was significance between gender and the negative subscale and between family type and the positive and negative subscales based on the subscales of the Attitudes toward the COVID-19 Vaccine Scale, which affected attitudes toward vaccination positively. This indicates the importance of planned training programs on disease and vaccination for the members of a family, the smallest unit of society in terms of interaction.

Conclusion

In this study, the nursing students had high levels of perceptions of COVID-19 and positive attitudes toward the COVID-19 vaccine. The nursing students had high scores in the dangerousness and infectious subscales regarding their perception of the disease. In addition, they had higher scores in the positive subscale than in the negative subscale concerning their attitudes toward the COVID-19 vaccine. The study found a positive, significant relationship between the subscales of the COVID-19 Disease Perception Scale and those of the Attitudes toward the COVID-19 Vaccine Scale. A positive, insignificant relationship was observed only between the infectiousness subscale of the COVID-19 Disease Perception Scale and the negative subscale of the Attitudes toward the COVID-19 Vaccine Scale. There was a significant difference between the groups in both scales based on gender and only in the Attitudes toward the COVID-19 Vaccine Scale based on family type. In line with the data obtained, planned training programs should be organized using different training strategies, curricula should be revised, and qualitative and quantitative studies should be conducted on larger and more extensive groups to help nursing students gain positive attitudes toward the COVID-19 perception and COVID-19 vaccine in order to be prepared for the COVID-19 pandemic and future pandemics.

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References

1. Earnshaw V.A., Eaton L.A., Kalichman, S.C., Brousseau N.M., Hill, E.C., Fox, A.B. COVID-19 conspiracy beliefs, health behaviors, and policy support.

Transl. Behav. Med, 2020; 10(4): 850–856.

2. Paul E., Steptoe A, Fancourt D. Attitudes towards vaccines and intention to vaccinate against COVID-19: Implications for public health communication. The Lancet Regional Health Eu., 2020. doi:10.1016/j.lanepe.2020.100012

3. Coler R. N., Mccullough M. P., Chappell J. D., Denison M. R., Stevens L. J., MorabitoK. M., Dell S. O., Schmidt,S. D., Ii, P. A. S., Padilla, M., Mascola, J. R., Buchanan W., Tautges, R. P., Ledgerwood, J. E., Graham B. S., &Beigel J. H. An mrna Vaccine against SARS-cov-2 — Preliminary Report, 2020.

4. Yoda T., Katsuyama H. Willingness to Receive COVID-19 Vaccination in Japan. Vaccines, 2021; 9(1): 48.

5. Geniş B., Gürhan N., Koç M., Geniş Ç., Şirin B., Çırakoğlu O. C., Coşar, B. Development of Perception and Attitude Scales Related with COVID-19 Pandemia. Pearson Journal of Social Sciences - Humanities, 2020; 5(7): 306-328. doi: 10.46872/pj.127

6. Sandalcı B., Uyaroğlu O.A., Sain Güven G. COVID-19'da kronik hastalıkların rolü, önemi ve öneriler. Flora, 2020; 25: 1-7.

7. Zhou F.,Yu T., Du R., Fan G., Liu Y., Liu Z. Clinical course and risk factors formortality of adult in patients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet, 2020a; 395(10229): 1054-62.

8. Guo T, Fan Y, Chen M, et al. Cardiovascular implications of fatal outcomes of patients with corona virus disease 2019 (COVID-19). JAMA Cardiol, 2020; March 27 (Epub ahead of print).

9. Mehra M.R., Desai S.S., Kuy S., Henry T.D., Patel A.N. Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19. N Engl J Med., 2020; 382: e102.

10. Chen Q., Liang M., Li Y., Guo J., Fei D., Wang L., Wang J. Mental Health Care for Medical Staff in China During the COVID-19 Outbreak. The Lancet Psychiatry, 2020; 7(4): e15-e16.

11. Guan W.J., Ni Z.Y., Hu Y., Liang W.H., Ou CQ., He J.X., Liu L., Shan, H., Lei C.L., Hui D.S.C., Du B., Li L.J., Zeng G., Yuen K.Y., Chen R.C., Tang C.L., Wang T., Chen P.Y., Xiang J., Li, S.Y., Wang J.L., Liang Z.J., Peng Y.X., Wei L., Liu Y., Hu Y.H., Peng P., Wang J.M., Liu J.Y., Chen Z., Li G., Zheng Z.J., Qiu S.Q., Luo J., Ye C.J., Zhu S.Y., Zhong N.S. China Medical Treatment Expert Group for Covid-19. Clinical Characteristics of Corona virus Disease 2019 in China. N Engl J Med., 2020; 382(18): 1708-1720.

12. Zhao Q., Meng M., Kumar R., Wu Y., Huang J., Lian N., Deng Y., Lin. S. The impact of COPD and smoking history on the severity of COVID-19: A systemic review and meta-analysis. J Med Virol., 2020b; 92: 1915–1921.

13. Nguyen HT, Do BN, Pham KM, Kim GB, Dam HT, Nguyen TT, et al. Fear of COVID-19 scale-associations of its scores with health literacy and health-related behaviors among medical students. Int J Environ Res Public Health, 2020; 17(11): 4164. doi: 10.3390/ijerph17114164.

14. Yakar B., Öztürk Kaygusuz T., Pirinçci E., Onalan E. Knowledge, attitude and anxiety of medical students about the current COVID-19 outbreak in Turkey. Aile Hekimliği ve Palyatif Bakım, 2020; 5(2): 36-44.

15. Taneri P.E. Salgının başlangıç döneminde İstanbul'da bir Tıp Fakültesi öğrencilerinin COVID-19 hakkında bilgi ve görüşlerinin değerlendirilmesi. Turk J PublicHealth, 2020; 18: 78-85.

16. Synnott C.K. College Student's COVID-19 Vaccine Hesitancy. J Higher Educ. Manag., 2021; 36 (1).

17. Barello S., Nania T., Dellafiore F., Graffigna G., Caruso R. Vaccine hesitancy' among university students in Italy during the COVID-19 pandemic. Eur J Epidemiol., 2020; 35(8): 781-783.

18. Adıbelli D., İlaslan E. COVID-19 Aşı Reddi Olan Hemşire Adaylarının Görüşleri: Bir Fenomenolojik Çalışma, Türkiye Klinikleri Hemşirelik Bilimleri Dergisi, 2022; 14(4): 1038-45.

19. Wang J., Jing R., Lai X., Zhang H., Lyu Y., Knoll M.D., Fang H. Acceptance of COVID-19 Vaccination during the COVID-19 Pandemic in China. Vaccines, 2020; 8: 482.

20. EzatiRad R., Kahnouji K., Mohseni S., Shahabi N., Noruziyan F., Farshidi H., Hosseinpoor M., Kashani S., Takhti H.K., Azad M.H., Aghamolaei T. Predictingthe COVID-19 vaccine receive intention based on the theory of reason edaction in the south of Iran. BMC Public Health, 2022; 22(1): 1-13.

21. Alıcılar HE, Çöl M. Yeni Koronavirüs hastalığına karşı aşılanma tutumu. Yeni Koronavirüs Pandemisi sürecinde Türkiye'de Covid-19 aşılaması ve bağışıklama hizmetlerinin durumu. Türk Tabipleri Birliği, 24 Mayıs 2021, https://ttb.org.tr/userfiles/files/yeni_koro navirus_pandemisi_surecinde_turkiyede_ covid19_asilamasi_ve_bagisiklama_hiz metlerinin_durumu.pdf.] 10.11.2022.

22. Yalçın Balçık P, Demir H. Aşı karşıtlığı ve ekonomisi. Hacettepe Sağlık İdaresi Dergisi, 2021; 24(2): 375-98.

23. Yılmaz D., Karaman D., Yılmaz H. İntörn hemşirelik öğrencilerinin Koronavirüs (COVID-19) korkusunun aşı karşıtlığına etkisinin incelenmesi. Jour Turk Fam Phy, 2021; 12(4): 179-191.

24. Kwok K. O., Li K.K., WEI W.I., Tang A., Wong S.Y.S., Lee S.S. Influenza vaccine uptake, COVID-19 vaccination intention and vaccine hesitancy among nurses: A survey. Int. J. Nurs. Stud., 2021; 114: 103854.

25. Nadeem M., Khaliq N. A. Study of community knowledge, attitudes, practices, and health in Pakistan during the COVID-19 pandemic. J Community Psychol., 2021; 1–18.

26. Oktay Gültekin E., Gültekin O. Sağlık çalışanlarının COVID-19 aşı tutumu. Turk Mikrobiyol Cemiy Derg, 2022; 52(2): 119-130.

27. Lin Y., Hu Z., Zhao Q., Alias H., Danaee M., Wong, L.P. Understanding COVID-19 vaccine demand and hesitancy: A nationwide online survey in China. PloS Negl Trop Dis., 2020; 14(12): e0008961.

28. Paterson P., Meurice F., Stanberry L.R., Glismann S., Rosenthal S.L., Larson H.J. Vaccine hesitancy and health care providers. Vaccine, 2016; 34: 6700-6706.

29. Deem M.J. Nurses' Voices Matter in Decisions About Dismissing Vaccine-Refusing Families. Am. J Nurs., 2018; 118(8): 11.

30. Olaimat A. N., Aolymat I., Shahbaz H.M., Holley R.A. Knowledge and Information Sources About COVID-19 Among University Students in Jordan: A Cross-Sectional Study. Front Public Health, 2020; 8: 254.

31. Alzoub H., Alnawaiseh N., Al-Mnayyis A., Abu-Lubada M., Aqel A,, Al Shagahin H. COVID-19 - knowledge, attitude and practice among medical and non-medical university students in Jordan. J. Pure Appl Microbiol., 2020; 14: 17–24.

32. Ali K.F., Whitebridge S., Jamal M.H., Alsafy M., Atkin S.L. Perceptions, Knowledge, and Behaviors Related to COVID-19 Among Social Media Users: Cross-Sectional Study. J. Med. Internet Res., 2020; 22: e19913.

33. How to Protect Yourself and Others, Avaliable from: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html, 2 April 2023

34. Aslan H, Pekince H. Nursing students' views on the COVID-19 pandemic and their percieved stress levels. Perspect Psychiatr Care, 2021; 57: 695–701.

35. Öncü E., Altunkan H., Vayısoğlu S., Ayaz M. COVID-19 Pandemi sürecinde kaderciliğin etkisi ve salgın tedbirlerine uyum özellikleri: Vaka-kontrol çalışması, Mersin UnivSaglık Bilim Derg, 2021; 14(1): 113-124.

36. Murdaca G., Pioggia G., Negrini S. Vitamin D and Covid-19: an update on evidence and potential therapeutic implications. Clin Mol Allergy, 2020; 18(23): 2-8.

37. Batırel A. SARS-CoV-2: Bulaşma ve Korunma, South. Clin. Ist. Euras., 2020; 31(Suppl): 1-7.

38. Erkekoğlu P., Köse S. B. E., Balcı A., Yirün A. Aşı Kararsızlığı ve COVID-19'un Etkileri. Literatür Eczacılık Bilimleri Dergisi, 2020; 9(2): 208-220.

39. Coşkun Erçelik, H., Çamlıca T. Hemşirelik Öğrencilerinin COVID-19 Korkusu ve Aşıya Yönelik Tutumlarının Değerlendirilmesi: Tanımlayıcı Bir Kesitsel Araştırma, Türkiye Klinikleri Hemşirelik Bilimleri Dergisi, 2022; 14(1): 224-31.

40. Ekiz, T., Ilıman, E., Dönmez, E. Bireylerin sağlık anksiyetesi düzeyleri ile COVID-19 salgını kontrol algısının karşılaştırılması. Uluslararası Sağlık Yönetimi ve Stratejileri Araştırma Dergisi, 2020; 6: 139-154.

41. Bali EB, Tanalp TD, Çelebi İ. Yeni tip koronavirüs (COVID-19) pandemisi bilgi ve korunma yolları hakkında sağlık teknikeri adaylarının farkındalık düzeyleri. FLORA, 2021; 26(1): 67-77.

42. Schwarzinger M., Watson V., Arwidson P., Alla F., Luchini S. COVID-19 vaccine hesitancy in a representative working-age population in France: a survey experiment based on vaccine characteristics. Lancet Public Health, 2021; S2468-2667(21): 00012- 0 0018.