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Immunization in health employees: Relationship of confidence and attitude

Dilek Yildirim[a], Cennet Ciris Yildiz[b], and Berna Dincer[c]

[a]Nursing Department, Faculty of Health Sciences, Istanbul Aydin University Istanbul, Turkey; [b]Nursing Department, Faculty of Health Sciences, Istanbul Kent University, Istanbul, Turkey; [c]Nursing Department, Faculty of Health Sciences, Istanbul Medeniyet University, Istanbul, Turkey

ABSTRACT

This is a cross-sectional online survey study performed to identify whether the health employees' confidence in the vaccine besides their confidence in the administrators about the vaccine had any effect on their attitudes toward the vaccine. The study was carried out on February 2021 with the participation of 402 health employees working in the pandemic hospitals. Approximately 33% of the participant health employees stated that they did not think of being vaccinated during the COVID-19 pandemic. Insufficient testing for the vaccines that are developed to fight against pandemics, having fear about their side effects, and finding them unreliable give rise to vaccine hesitancy in health employees. Besides, it was identified that the health employees' confidence in the vaccines and their confidence in the administrators about the vaccines affected their attitudes toward vaccination.

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Attitude; confidence; health employees; immunization

Introduction

The coronavirus (COVID-19) pandemic caused by the SARS-CoV-2 virus that emerged in Wuhan city of China on 31 December 2019 spread to six continents and hundreds of countries quickly and put its stamp on history as the first pandemic caused by the coronavirus.[1] As adequate information about this virus was not present, challenges were experienced particularly in its treatment, and the disease spread rapidly.[2] On the one hand, all efforts are continuously made to provide the existing patients with treatment and prevent the virus from spreading; on the other hand, new knowledge about the virus is acquired, scientific studies are performed, and the approaches are constantly updated.[2] It was identified that there were 110,763,898 confirmed COVID-19 cases and 2,455,331 deaths across the world as of 21 February 2021.[3] In this conjunction, one of the most significant problems in the world is that the health employees who struggle against the COVID-19 pandemic lose their lives due to being infected with the disease. In the analysis conducted in September 2020 by Amnesty International, it was found that, across the world, at least 7,000 health employees died due to being infected with COVID-19. In this report, Mexico (minimum 1,320) and the USA (minimum 1,077) were recorded as the countries with the highest number of health employees who died of COVID-19. Turkey ranks 24th on this list.[4] Also, the last report released by Amnesty International in May 2021 indicated that at least 17,000 health employees died of COVID-19 across the globe in the first year of the pandemic.[5] Moreover, in Turkey, 403 health employees lost their lives from 17 March 2020 to 31 May 2021 due to the COVID-19-related causes according to the data gathered by the Turkish Medical Association in cooperation with the local medical associations, labor unions, and other relevant health organizations.[6]

Avoiding contact, knowing the ways of contamination and staying away from the contaminated areas, protecting the vulnerable areas of the human body from infection, having effective disinfection, and having strengthened immune system make it possible to be protected against infection particularly during such pandemics.[7] Besides these protection principles, the vaccination programs were already initiated against pandemics across the world, and further efforts on this topic continue. In the vaccination programs, priority was given to the high-risk groups such as healthcare professionals. The identification of obstacles that prevent vaccination is necessary particularly to ensure that this vaccination program succeeds.

CONTACT Cennet Ciris Yildiz cennetciris.yildiz@kent.edu.tr; cennet_ciris@hotmail.com Nursing Department, Istanbul Kent University Faculty of Health Sciences, Istanbul, 34433 Turkey.

The World Health Organization (WHO) listed the factors that prevent vaccination under three categories: Individual and Group Influences, Contextual Influences, and Vaccine/Vaccination-Specific Issues.[8,9] Particularly the personal perceptions and understandings of the groups and persons about vaccination and the effects of vaccination, their knowledge/awareness levels, perception of risks/benefits, confidence in the healthcare system and healthcare providers, and beliefs and approaches about health and preventive practices were defined as the individual/social influences.[8,9] As per the review of the studies performed on this topic, Argüt et al. (2016) identified that the factors that affected vaccine acceptance were access to vaccines, past experiences, knowledge levels, cost, and confidence in the healthcare system and healthcare providers while the research study that was carried out by Kata (2010) on the anti-vaccination movements on the internet ascertained that the safety issue was addressed in all anti-vaccination websites.[9,10] Upon the examination of the health employees' reasons for rejecting vaccination in influenza outbreaks, it was found that the disbelief in the reliability of the vaccine, the medical contraindications of the vaccine, the personal beliefs, the fear of injections, the neglect toward the disease, and the beliefs that the effects of the disease could be mild and beneficial and, along with vaccination, the disease would be caught.[11] Therefore, in an effort to fight the pandemics effectively, it is important to identify the health employees' attitudes toward vaccines and their confidence in the vaccines as well as their confidence in the administrators about the vaccines.

Materials and methods

This is a cross-sectional online survey study performed to identify whether health employees' confidence in the vaccines besides their confidence in the administrators about the vaccines had any effect on their attitudes toward the vaccines.

Population and sample

The research population is comprised of the health employees who worked for the pandemic hospitals in Turkey. Considering the process of the COVID-19 pandemic, no sampling method was utilized to select the research sample. Based on the data obtained from a similar study in the relevant literature, the sample size was calculated by using G-Power 3.1 software.[12] In this respect, the sample size was calculated as 320 with a power of 90% and at the significance level of 5%. The research data were collected on February 2021. Invitation to participate in the study and the internet link of the data collection tool both were sent online to all health employees who were included in the research population. The health employees who agreed to participate in the research and had internet access were included in the research sample. After sending recurring reminders to encourage participation in the research and providing adequate time to respond, a total of 437 health employees filled in the online survey form. However, due to the entry of missing and erroneous data, 35 health employees were excluded from the study, and hence, 402 health employees formed the research sample.

Data collection

As the data collection tool, the survey form that was prepared by the researchers in light of the relevant literature was utilized.[9,11,13] The survey form was comprised of three parts designed to find out the participant health employees' sociodemographic characteristics, their attitudes toward the vaccines developed alongside the pandemics, and their confidence in them.

The first part of the survey form (questions 1–10) aimed to identify the participants' age, gender, marital status, education level, profession, service unit, duration of service, whether they thought of being vaccinated against pandemics, why they got vaccinated, and why they did not get vaccinated. The second part of the survey form aspired to explore the attitudes toward the vaccines developed against pandemics. The questionnaire that aimed to designate the health employees' attitudes toward the vaccines in the struggle against pandemics was quoted from the study by Karacaer et al. (2015).[13] This questionnaire has 11 questions. The Cronbach's alpha coefficient was calculated as 0.898 for the questionnaire utilized in this study to evaluate the attitudes toward vaccination. The total score varies between 11 and 55 points.

The third part of the survey form aimed to identify the participants' confidence in the vaccines developed during a pandemic as well as their confidence in the administrators about the vaccines. As there was no scale developed to find about the confidence in the vaccines and the confidence in the administrators about the vaccines, a draft scale that was composed of 22 items was developed in light of the relevant literature through individual interviews held with five health employees who worked actively during the

pandemic. Next, the validity and reliability analysis was conducted for the draft scale. In this regard, firstly, the content validity of the draft scale was analyzed. The expert opinions were received for the analysis of the content validity (5 academician nurses, 4 specialist doctors, 2 academician midwives). The experts checked the acceptability of items of the draft scale by scoring each item as 1 (unacceptable), 2 (somewhat acceptable), 3 (acceptable), and 4 (highly acceptable). The scores were evaluated as per the Davis technique, and the two items with Content Validity Index (CVI) values below 0.80 were left out of the draft scale. The CVI values ranged from 0.87 to 1.00 for the rest of the items. Subsequently, the structural validity of the draft scale was analyzed, and after this analysis, a scale comprised of 20 questions and two sub-scales came into being. This scale called 'Inventory of Confidence in the Vaccines and Confidence in the Administrators about the Vaccines' is a five-point Likert-type scale (I strongly disagree = 1, I disagree = 2, Neither agree nor disagree = 3, I agree= 4, I strongly agree = 5). The seventh question is reverse-scored in this questionnaire. The answers to the questions are scored from 1 to 5 points and hence, the total score to be obtained from the scale ranges from 24 to 96 points. A high overall score obtained from the scale indicates that the respondent has high-level confidence. The Cronbach's Alpha coefficient was calculated as 0.947, 0.947, and 0.827 successively for the overall scale, its 'confidence in the administrator' sub-scale, and its 'confidence in the vaccine' sub-scale.

Data analysis

The data collected under the research were evaluated via the SPSS (Statistical Package for Social Science) 21.0 for Windows. In the research, the descriptive data about the continuous variables were expressed as the means, standard deviations, and minimum and maximum values while the descriptive data about the categorical variables were indicated as the frequencies and percentages. The distribution of research data was evaluated via the Kolmogorov-Smirnov Test, and it was ascertained that the research data were normally distributed. In the comparison of the independent groups, the independent samples t-test and chi-squared test were utilized. The internal consistency of the scale and its sub-scales that were employed to identify the attitude toward vaccination and the confidence in the vaccines and the administrators was tested with the Cronbach's alpha (α) coefficient. The relationships between the attitude toward vaccination, and confidence in the vaccines and administrators were analyzed through the Pearson correlation test. The relationships between the attitude toward vaccination, confidence in the vaccines and administrators the relationship between gender, and marital status were analyzed through the Eta Coefficient test (η). In all analyses, statistical significance was identified if $p < 0.05$ (two-tailed).

Ethical approval

The ethical endorsement for the study was obtained from the Istanbul Sabahattin Zaim University Research Ethics Committee (Number: 02/2021). The administrators (chiefs of clinics, nurse supervisors) who served in the institutions where the research was conducted were contacted, and the survey form was conveyed to the health employees through the administrators. Research permission was obtained from the General Directorate of Health Services for the study. The informed consent form was created for the health employees and placed on the first page of the online data collection tool, and the health employees were asked to consent to participate in the study at the beginning of the survey form. After receiving all the permissions for the research, the research began. To obtain anonymous responses from the participant health employees, e-mail addresses and IP addresses were completely excluded in data collection, and hence, the participant confidentiality was respected. Moreover, to use the attitude questionnaire in the research, the written permission was received from the researchers who developed it.

Results

A total of 402 health employees took part in the study. The participant health employees' descriptive characteristics were briefly indicated in Table 1. While 66.7% of the participant health employees' (n = 268) stated that they thought of being vaccinated in the context of the fight against the pandemic, 33.3% of them (n = 134) set forth that they thought of doing the opposite (Table 1). As per the participant health employees' descriptive characteristics, there was no statistically significant difference in their thoughts about being vaccinated ($p > 0.05$).

As per the review of the reasons for thinking of being vaccinated, the most common three reasons were identified as ensuring self-protection (69.4%), not infecting the family members with the disease

(64.1%), and not infecting the patients with the disease (43.2%). Upon the examination of the reasons for thinking of not being vaccinated, it was found that the most frequently reported three reasons were to think that the vaccine was not sufficiently tested yet (65.6%), to have fear about its side effects (59.7%), and to find the vaccine unreliable (38.8%). The participant health employees could state multiple reasons as the response to these two questions above (Table 2).

Table 1. Participant health employees' descriptive characteristics (n:402).

Characteristics		Number (n)	Percentage (%)
Age	18–25 years	165	41
	26–35 years	167	41.5
	36–45 years	63	15.7
	≥46 years	7	1.7
Gender	Female	282	70.1
	Male	120	29.9
Marital status	Married	137	34.1
	Single	265	65.9
Education level	High school	18	4.5
	Associate program	107	26.6
	Undergraduate program	201	50
	Graduate program	76	18.9
Profession	Physician	79	19.7
	Nurse	197	49
	Midwife	37	9.2
	Other auxiliary health staff	89	22.1
Duration of service	<1 year	110	27.4
	1–10 years	197	49
	11–20 years	74	18.4
	≥21 years	21	5.2
Service unit	Surgery	55	13.7
	Internal medicine	58	14.4
	Intensive care	54	13.4
	Pediatry	26	6.5
	Emergency	91	22.6
	Pandemic	41	10.2
	Operating room	30	7.5
	Polyclinic	38	9.4
	Gynecology	9	2.2
Whether the participant thinks of being vaccinated in the fight against pandemic	Yes	268	66.7
	No	134	33.3

The breakdown of the responses given to the statements addressed to the participant health employees, who thought of being vaccinated and not being vaccinated, to find out their attitudes and the inter-group comparisons of these responses were displayed in Table 3. The Cronbach's alpha coefficient was calculated as 0.898 for the questionnaire utilized in this study to evaluate the attitudes toward vaccination. The mean of scores obtained from this questionnaire by the participant health employees thinking of being vaccinated (38.84 ± 10.26 points) was higher than the mean of scores obtained by the participant health employees thinking of not being vaccinated (34.59 ± 8.32 points), and this difference was statistically significant ($p = 0.001$).

The breakdown of the responses given to the statements addressed to the participant health employees, who thought of being vaccinated and thought of doing the opposite, to explore their views about the confidence in the vaccines and administrators and the inter-group comparisons of these responses were indicated in Table 4. The Cronbach's alpha coefficient was calculated as 0.947, 0.947, and 0.827 successively for the questionnaire utilized to find about the views about the confidence in the vaccines and administrators, and its 'confidence in the administrator' sub-scale and 'confidence in the vaccine' sub-scale. The mean of scores obtained from this questionnaire by the participant health employees thinking of being vaccinated (65.53 ± 17.11 points) was higher than the mean of scores obtained by the participant health employees thinking of doing the opposite (57.60 ± 16.15 points), and this difference was statistically significant ($p = 0.001$).

Relationships between the attitudes of the participants, who think of being vaccinated and think of doing the opposite, toward vaccination, their confidence in the vaccines and administrators, the gender, and the marital status were presented in Table 5. It was ascertained that there was a statistically significant moderately positive relationship between the attitudes

Table 2. Reasons for thinking of being vaccinated and thinking of doing the opposite.

	Reasons	Percentage (%)	Number (n)
Reasons for thinking of being vaccinated (n:268)	Ensuring self-protection	69.4	186
	Having fear of infecting family members with the disease	64.1	172
	Having fear of infecting patients with the disease	43.2	116
	Thinking that the vaccination offers extensive protection	39.5	106
	Thinking that being vaccinated is a professional obligation	29.4	79
	Thinking of being vaccinated due to the pressure from the administration and coworkers	5.5	15
	Others	6.3	17
Reasons for thinking of not being vaccinated (n:134)	Thinking that the vaccine is not sufficiently tested	65.6	88
	Being afraid of the side effects of the vaccine	59.7	80
	Finding unreliable	38.8	52
	Being affected by the negative news in the media	17.9	24
	Not having adequate information about the vaccines	15.6	21
	Preferring to use other protection methods	10.4	14
	Others	29.8	40

Table 3. Comparison of the attitudes of participant health employees, who think of being vaccinated and think of doing the opposite, toward vaccination.

	Participants thinking of being vaccinated (n = 268)					Participants thinking of not being vaccinated (n = 134)						
	n (%)					n (%)					Chi-squared test	
Items	I strongly disagree	I disagree	Neither agree nor disagree	I agree	I strongly agree	I strongly disagree	I disagree	Neither agree nor disagree	I agree	I strongly agree	X^2	*p*
1. Only certain people should be vaccinated based on certain special circumstances such as age, profession, and disease.	63 (23.5)	123 (45.9)	30 (11.2)	37 (13.8)	15 (5.6)	28 (20.9)	48 (35.8)	25 (18.7)	28 (20.9)	5 (3.7)	9.43	0.06
2. When I make my decision to be vaccinated, I should have adequate information about that disease.	30 (11.2)	9 (3.4)	12 (4.5)	105 (39.2)	112 (41.8)	10 (7.5)	8 (6)	8 (6)	44 (32.8)	64 (47.8)	4.78	0.31
3. Whether a person whom I trust has a vaccine or has positive thoughts about being vaccinated affects my decision to get that vaccine.	33 (12.3)	28 (10.4)	35 (13.1)	127 (47.4)	45 (16.8)	18 (13.4)	24 (17.9)	32 (23.9)	49 (36.6)	11 (8.2)	17.32	0.002
4. I advise my patients/relatives to be vaccinated.	25 (9.3)	12 (4.5)	36 (13.4)	97 (36.2)	98 (36.6)	17 (12.7)	19 (14.2)	53 (39.6)	25 (18.7)	20 (14.9)	62.70	0.001
5. Whether the health center where the vaccination takes place is sufficiently equipped for emergencies affects my decision to be vaccinated.	24 (9)	18 (6.7)	28 (10.4)	104 (38.8)	94 (35.1)	12 (9)	25 (18.7)	16 (11.9)	43 (32.1)	38 (28.4)	14.41	0.006
6. I accept to be vaccinated if a country-wide epidemic or a global pandemic erupts.	27 (10.1)	10 (3.7)	20 (7.5)	104 (38.8)	107 (39.9)	20 (14.9)	21 (15.7)	47 (35.1)	22 (16.4)	24 (17.9)	86.75	0.001
7. Whether the vaccine is produced by a company that I trust affects my decision to be vaccinated.	28 (10.4)	14 (5.2)	39 (14.6)	100 (37.3)	87 (32.5)	16 (11.9)	10 (7.5)	20 (14.9)	52 (38.8)	36 (26.9)	1.90	0.75
8. News in the media influence my thoughts about the efficacy of the vaccines for seasonal flu etc.	43 (16)	49 (18.3)	56 (20.9)	79 (29.5)	41 (15.3)	26 (19.4)	17 (12.7)	30 (22.4)	51 (38.1)	10 (7.5)	8.74	0.06
9. What the people who serve as a desirable model for society think about vaccination affects my decision on this issue.	37 (13.8)	49 (18.3)	60 (22.4)	76 (28.4)	46 (17.2)	31 (23.1)	31 (23.1)	35 (26.1)	28 (20.9)	9 (6.7)	15.22	0.004
10. My past experiences in vaccination affect my decision to be vaccinated again in the future.	35 (13.1)	27 (10.1)	35 (13.1)	113 (42.2)	58 (21.6)	24 (17.9)	20 (14.9)	29 (21.6)	49 (36.6)	12 (9)	16.31	0.003
11. Being a health employee requires me to be vaccinated for myself, my family, and my patients.	31 (11.6)	4 (1.5)	24 (9)	104 (38.8)	105 (39.2)	24 (17.9)	22 (16.4)	44 (32.8)	26 (19.4)	18 (13.4)	93.26	0.001
Total score, Mean ± SD (Min-Max)	38.84 ± 10.26 (11–55)					34.59 ± 8.32 (11–51)					0.001*	

*Independent Samples T-Test, statistical significance level: 5% ($p < 0.05$).

Table 4. Comparison of the confidence felt by the participants, who thinks of being vaccinated and thinks of doing the opposite, in the vaccine and the administrators.

	Participants thinking of being vaccinated (n = 268)					Participants thinking of not being vaccinated (n = 134)					Chi-squared test	
	n (%)					n (%)						
Items	I strongly disagree	I disagree	Neither agree nor disagree	I agree	I strongly agree	I strongly disagree	I disagree	Neither agree nor disagree	I agree	I strongly agree	X^2	*p*
Confidence in the administrator												
1. Our administrators attach importance to the health employees' thoughts about the vaccines.	44 (16.4)	51 (19)	70 (26.1)	68 (25.4)	35 (13.1)	27 (20.1)	36 (26.9)	29 (21.6)	33 (24.6)	9 (6.7)	7.27	0.12
2. Our administrators stop applying the vaccine when there is evidence that there is a serious risk.	24 (9)	15 (5.6)	79 (29.5)	100 (37.3)	50 (18.7)	19 (14.2)	20 (14.9)	43 (32.1)	42 (31.3)	10 (7.5)	19.81	*0.001*
3. Our administrators do a good job in protecting us from pandemics and their effects.	48 (17.9)	37 (13.8)	62 (23.1)	84 (31.3)	37 (13.8)	27 (20.1)	24 (17.9)	45 (33.6)	28 (20.9)	10 (7.5)	11.47	*0.02*
4. If we have a concern about the vaccines, it is taken seriously by our administrators.	43 (16)	35 (13.1)	65 (24.3)	86 (32.1)	39 (14.6)	22 (16.4)	27 (20.1)	40 (29.9)	34 (25.4)	11 (8.2)	8.23	0.08
5. I can comfortably tell my administrators about my views on the vaccination efforts.	41 (15.3)	31 (11.6)	51 (19)	103 (38.4)	42 (15.7)	20 (14.9)	19 (14.2)	40 (29.9)	44 (32.8)	11 (8.2)	9.65	*0.04*
6. Our administrators take the health employees' needs into consideration in the vaccination efforts and put them at the top of the list.	33 (12.3)	21 (7.8)	47 (17.5)	112 (41.8)	55 (20.5)	16 (11.9)	25 (18.7)	32 (23.9)	43 (32.1)	18 (13.4)	15.63	*0.004*
7. I do not think that my administrators really attach importance to us (health employees).	44 (16.4)	68 (25.4)	63 (23.5)	46 (17.2)	47 (17.5)	25 (18.7)	30 (22.4)	26 (19.4)	28 (20.9)	25 (18.7)	2.00	0.73
8. I trust my administrators' decisions about the vaccines.	40 (14.9)	29 (10.8)	80 (29.9)	86 (32.1)	33 (12.3)	28 (20.9)	30 (22.4)	54 (40.3)	14 (10.4)	8 (6)	33.29	*0.001*
9. I feel that my administrators' do everything about pandemics.	35 (13.1)	54 (20.1)	64 (23.9)	78 (29.1)	37 (13.8)	16 (11.9)	35 (26.1)	28 (20.9)	33 (24.6)	22 (16.4)	2.93	0.56
10. I trust that our administrators will make appropriate decisions about the vaccines.	31 (11.6)	22 (8.2)	88 (32.8)	100 (37.3)	27 (10.1)	29 (21.6)	26 (19.4)	43 (32.1)	28 (20.9)	8 (6)	24.75	*0.001*
11. About the vaccination efforts, our administrators behave honestly toward us.	34 (12.7)	28 (10.4)	91 (34)	89 (33.2)	26 (9.7)	29 (21.6)	32 (23.9)	43 (32.1)	20 (14.9)	10 (7.5)	26.97	*0.001*
12. My administrators can solve the problems encountered by me about the vaccines.	33 (12.3)	34 (12.7)	79 (29.5)	94 (35.1)	28 (10.4)	30 (22.4)	25 (18.7)	40 (29.9)	30 (22.4)	9 (6.7)	13.97	*0.007*
13. My administrators are equipped with adequate knowledge to be able to check whether the decision that I make about the vaccines is appropriate.	34 (12.7)	43 (16)	70 (26.1)	93 (34.7)	28 (10.4)	21 (15.7)	32 (23.9)	47 (35.1)	26 (19.4)	8 (6)	15.04	*0.005*
14. I can discuss my questions about the vaccines with my administrators in suitable environments.	39 (14.6)	41 (15.3)	69 (25.7)	88 (32.8)	31 (11.6)	26 (19.4)	27 (20.1)	42 (31.3)	31 (23.1)	8 (6)	9.28	0.06
15. My administrators hide no information about the vaccines from us.	41 (15.3)	41 (15.3)	81 (30.2)	76 (28.4)	29 (10.8)	30 (22.4)	21 (15.7)	54 (40.3)	20 (14.9)	9 (6.7)	13.59	*0.009*
16. I have the freedom to disagree with my administrators about the vaccines.	22 (8.2)	16 (6)	56 (20.9)	117 (43.7)	57 (21.3)	21 (15.7)	10 (7.5)	34 (25.4)	47 (35.1)	22 (16.4)	8.44	0.07
17. My administrators receive our views as health employees when they are supposed to make decisions about the vaccines.	34 (12.7)	41 (15.3)	83 (31)	76 (28.4)	34 (12.7)	33 (24.6)	31 (23.1)	35 (26.1)	25 (18.7)	10 (7.5)	16.99	*0.002*
Confidence in the vaccine												
18. I think that vaccines are safe (COVID-19, Ebola, and so on).	18 (6.7)	27 (10.1)	84 (31.3)	111 (41.4)	28 (10.4)	24 (17.9)	39 (29.1)	53 (39.6)	13 (9.7)	5 (3.7)	66.22	*0.001*
19. I think that vaccines are effective for the protection against diseases and pandemics.	23 (8.6)	10 (3.7)	43 (16)	131 (48.9)	61 (22.8)	10 (7.5)	19 (14.2)	46 (34.3)	41 (30.6)	18 (13.4)	38.07	*0.001*
20. I think that vaccines are essential to the fight against diseases/pandemics.	18 (6.7)	9 (3.4)	33 (12.3)	108 (40.3)	100 (37.3)	14 (10.4)	14 (10.4)	40 (29.9)	39 (29.1)	27 (20.1)	35.93	*0.001*
Total score, Mean ± SD (Min-Max)	65.53 ± 17.11 (23–96)					57.60 ± 16.15 (23–96)					*0.001**	

*Independent Samples T-Test, statistical significance level: 5% ($p < 0.05$).

Table 5. Relationships between the attitudes of the participants, who think of being vaccinated and think of doing the opposite, toward vaccination, their confidence in the vaccines and administrators, the gender, and the marital status.

	Participants thinking of being vaccinated (n = 268)			Participants thinking of not being vaccinated (n = 134)		
	Confidence in the vaccines and administrators	Gender[a]	Marital status[b]	Confidence in the vaccines and administrators	Gender[a]	Marital status[b]
Attitudes toward vaccination	*0.54*(0.001)**	0.014[♯]	0.004[♯]	*0.53*(0.001)**	0.152[♯]	0.011[♯]
Confidence in the vaccines and administrators	1	0.063[♯]	0.078[♯]	1	0.210 [♯]	0.085[♯]

Pearson correlation test $p < 0.05$*, $p < 0.01$.**
The data were expressed as r(p).
[a]Categorized as female and male.
[b]Categorized as married and single.
[♯]Eta Coefficient.

of the participant health employees, who think of being vaccinated, toward vaccination and the confidence in the vaccines and administrators (r = 0.54, $p = 0.001$) whereas there was no statistically significant relationship between other variables. Additionally, it was discerned that there was a statistically significant moderately positive relationship between the attitudes of the participant health employees, who think of not being vaccinated, toward vaccination and the confidence in the vaccines and administrators (r = 0.53, $p = 0.001$) whilst there was a statistically significant weak association between the confidence in the vaccines and administrators and the gender ($\eta = \mathbf{0.210}$).

Discussion

It is acknowledged that effective vaccination programs both protect the health staff and reduce hospital infections. Therefore, the rate of health employees' participation in the immunization is important. Considering the speed of spread of the virus particularly in the process of the current pandemic, this issue became even more important. In Turkey, it is recommended that everyone, in particular, the health employees and the people aged above 65 years, get the COVID-19 vaccine. Upon the review of the vaccination data table issued for Turkey by the Turkish Ministry of Health, it is discerned that the number of people getting the COVID-19 vaccine reached more than seven million people and one million people got the second dose of the COVID-19 vaccine as of 23 February 2021. However, to achieve herd immunity, 75%-90% of the society should be vaccinated with a vaccine that has 80% efficacy.[14] Moreover, as compared to the vaccination rates in the previous flu outbreaks, the rate of getting the COVID-19 vaccine remained low among the health employees despite all warnings stressing the importance of being vaccinated.[15] For this reason, this study was conducted to identify whether the health employees' confidence in the vaccines besides their confidence in the administrators about the vaccines had any effect on their attitudes toward the vaccines. The majority of the participant health employees' stated that they thought of being vaccinated in the context of the fight against pandemic while the rest of them said that they thought of doing the opposite. Likewise, in the study carried out by Kwok et al. (2021) on the nurses, it was ascertained that the percentage of those choosing to get a COVID-19 vaccine was 63% in spite of uncertainties about its efficacy, side effects, and the duration of its protection.[16] In another study performed on health employees, while 53.6% of the participants were interested in having the COVID-19 vaccine, the percentage of those not willing to have the vaccine despite having previously had the COVID-19 infection (53.5%) was high.[17] In a study carried out in France to find out about the COVID-19 vaccine hesitancy in health employees, it was stated that the nurses were less intent on having the vaccine than other health employees, and also, of all participants, 76.92% had at least one dose of the vaccine.[18] In a research study conducted by Dai (2020) on approximately 20,000 adults in 27 countries, it was found that 74% of all the participants aspired to get the COVID-19 vaccine when it became available, and in this respect, the highest percentages belonged to China (97%), Brazil (88%), and Australia (88%) whereas Russia (54%), Poland (56%), and Hungary (56%) had the lowest percentages.[19] As per the findings of this current study, it was discerned that the health employees' willingness to be vaccinated was below the world average in the case of a pandemic like COVID-19.

Most research studies focused on the COVID-19 vaccine hesitancy of the health employees and, in general, did not question why the health employees were vaccinated. In this current research, it was ascertained that the reasons for thinking of having the vaccine were to ensure self-protection and not to infect the family members and patients whilst the reasons for not having the vaccine were in a similar vein to those identified in the relevant literature.[20] Again, in a study

by Tomboloni et al. (2019) put forward that the health employees' reasons for not being vaccinated were the uncertainties about the safety and efficacy of the vaccine, fear about adverse reactions, fear of pain associated with the vaccine injection, fear of being injected more than once on a single occasion, belief that the vaccination is unnecessary, and the organizational difficulties in getting the vaccine.[21] Also, in a study conducted on nurses in China, 'suspicions about the effectiveness, efficiency, and safety', 'belief that the COVID-19 vaccine was unnecessary', and 'lack of time to have the vaccine' were among the reasons for the nurses to reject having the vaccine or to have vaccine hesitancy.[22] Certain studies certified that being exposed to side effects along with vaccination had a strong effect that reduced the willingness to be vaccinated.[23,24] To eliminate the vaccine hesitancy, the public should be assured particularly by the relevant authorities that all recommended directives were followed up in the process of preparing and testing the vaccine even if the vaccine was developed in a short period.[20]

In the current research, it was identified that the health employees' attitudes toward vaccination and their confidence in the vaccines and administrators affected whether the health employees thought of being vaccinated. In addition, the majority of the health employees thinking of being vaccinated stated that they also advised their patients\relatives to be vaccinated. Such advice is of high importance to community immunization. Likewise, in a study, it was ascertained that the adults' anti-vaccination attitudes and beliefs as well as the lack of their confidence in the vaccines affected their thought of having the COVID-19 vaccine.[25] In the Ministry of Health was the second most significant reason for not wanting to get the COVID-19 vaccine.[26] Likewise, the confidence in the institutions to which information about the vaccines is reported is a factor that is important to the acceptance of vaccines not only by the general population but also by the health employees.[27,28]

Furthermore, in the current research, it was identified that the attitudes of the participant health employees who thought of having or not having the vaccine were affected by their confidence in the vaccines and the administrators. In the previous studies performed about the COVID-19 vaccine, it is discerned that a negative attitude toward the vaccines to be developed was prevalent in the society and the main reason for this negative attitude pertained to the view that the new vaccines would be unsafe.[29,30] In a similar vein, it was set forth that the perception that the safety of vaccines developed in emergencies could not be guaranteed played a key role in the acceptance of the COVID-19 vaccines.[26] The health employees' attitudes toward the vaccines and their confidence in the vaccines and administrators are an important topic. The obtained findings will facilitate the development of vaccination campaigns aimed at preventing the current wave of a pandemic or future pandemics or getting prepared for them.

Conclusion

In this research, it was identified that insufficient testing for the vaccines that were developed to fight against pandemics, fearing about their side effects, and finding them unreliable gave rise to vaccine hesitancy in the participant health employees. Besides, it was ascertained that the participant health employees' confidence in the vaccines besides their confidence in the administrators about the vaccines affected the attitudes toward vaccination. If explanations about the vaccines that are still under development are sufficiently presented to the health employees, the administrators share enough information about them with the health employees, and the people who inspire confidence are firstly vaccinated, then the health employees can develop positive attitudes toward the vaccines and health employees' confidence in them can be increased. Moreover, it is essential that the administrators correct the inaccurate information which the health employees have about the vaccines still under development and share sufficient scientific data about the topics in which they think that adequate information is lacking.

Conflict of interest

No potential conflict of interest was reported by the authors.

ORCID

Dilek Yildirim http://orcid.org/0000-0002-6228-0007
Cennet Ciris Yildiz http://orcid.org/0000-0002-1351-5439
Berna Dincer http://orcid.org/0000-0001-7284-7495

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