Article published online: 2022-06-22

Knowledge Levels, Attitudes, and Behaviors of Health Care Professionals regarding COVID-19 Vaccines

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Libyan Int Medical Univ J 2022;7:12–16.

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Abstract

Background Shortly after the coronavirus disease 2019 (COVID-19) pandemic, vaccines were developed. Vaccination of the society in a short time may be the most important step in the fight against the pandemic. Health workers can be considered role models for society.

Aim We aimed to investigate the COVID-19 vaccination status of health care workers.

Methods The universe of our cross-sectional and descriptive study consisted of doctors, nurses, secretaries, interns, and other health care professionals. In the light of the literature, a questionnaire was prepared that questioned the attitudes and behaviors of the participants about vaccines. Face-to-face interviews were conducted during the visits. SPSS was used for statistical analysis.

Results A total of 806 volunteers, 51.4% (414) male and 48.6% (392) female, with a mean age of 32.7 ± 9.3 years, were included in the study. In total, 4.6% (37) of the participants in the study had not received any COVID-19 vaccine. Male participants were vaccinated statistically significantly more than female participants ($p = 0.044$). Of those vaccinated against COVID-19, 98.3% (774) had received at least two doses. Also, 26.9% (217) of health care workers had COVID-19 disease. The rate of those whose first-degree relatives had COVID-19 was 42.2% (340). A total of 87.3% (704) of health care workers reported that COVID-19 vaccines were safe. Also, 25.3% (204), 29.5% (238), and 35.0% (282) of the participants reported that state officials' vaccination in front of the media, social media news, and national media news, respectively, affected the decision to vaccinate.

Conclusion Although male health care workers have received more COVID-19 vaccines than female health care workers, vaccination rates of health care workers are at an acceptable level. Health workers comply with the calendar recommended by the ministry.

Keywords
- COVID-19
- health care professionals
- vaccines

published online
June 6, 2022

DOI https://doi.org/10.1055/s-0042-1747909.
ISSN 2519-139X.

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ملخص المقال باللغة العربية

مستويات المعرفة والمو اقف وسلوكيات المتخصصين في الرعاية الصحية فيما يتعلق بلقاحات كوفيد 19

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الأهداف: تم تطوير اللقاحات بعد وقت قصير من تفشي جائحة كوفيد 19. قد يكون تحصين المجتمع في وقت قصير أهم خطوة في مكافحة الوباء. يمكن اعتبار العاملين الصحيين قدوة للمجتمع. هذا البحث يسعى إلى التحقيق في حالة التطعيم ضد فيروس كورونا- كوفيد 19 للعاملين في مجال الرعاية الصحية.

المواد والطرق: تكونت عينة دراستنا المقطعية والوصفية من الأطباء والممرضات والسكرتيرات والمتدربين وغيرهم من المتخصصين في الرعاية الصحية. وعلى ضوء ما نشر سابقاً، تم إعداد استبيان لدراسة مواقف وسلوكيات المشاركين حول اللقاحات. كما أجريت المقابلات وجها لوجه خلال الزيارات.

التحليل الإحصائي: ثم إجراء الإحصاء الوصفي وتحليل البيانات باستخدام برنامج SPSS للتحليل الإحصائي.

النتائج: تم تضمين ما مجموعه 806 متطوعًا، 51.4٪ (414) ذكور، و48.6٪ (392) أناث، بمتوسط عمر 32.7±9.3 سنة. 4.6٪ (37) من المشاركين في الدراسة لم يتلقوا أي لقاح ضد كوفيد 19. تم تطعيم المشاركين الذكور بشكل ملحوظ إحصائيًا أكثر من المشاركين الإناث (p<0.04). 98.3٪ (774) ممن تم تطعيمهم ضد كوفيد 19 تلقوا جرعتين على الأقل. 26.9٪ (217) من العاملين في مجال الرعاية الصحية أصيبوا بمرض كوفيد 19. بلغ معدل أولئك الذين أصيب أقاربهم من الدرجة الأولي 42% (340). أفاد 87.3٪ (704) من العاملين في مجال الرعاية الصحية أن لقاحات كوفيد 19 كانت آمنة. أفاد 25.3٪ (204) من المشاركين أن تلقيح مسؤولي الدولة أمام وسائل الإعلام، و29.5 (238) أخبارًا على وسائل التواصل الاجتماعي، و35.0٪ (282) أخبارًا إعلامية وطنية أثرت على قرارهم أخذ التطعيم.

الاستنتاج: على الرغم من أن العاملين في مجال الرعاية الصحية الذكور تلقوا تطعيما أكثر من لقاحات كوفيد 19 من العاملات، إلا أن معدلات التطعيم للعاملين في الرعاية الصحية يعتبر عند المستوى المقبول. يلتزم العاملون الصحيون ببرنامج التطعيم الذي أوصت به الوزارة.

الكلمات المفتاحية: COVID-19، كوفيد 19، متخصصو الرعاية الصحية، اللقاحات، تركيا.

Introduction

Health care workers (HCW) are exposed to a high risk of coronavirus disease 2019 (COVID-19). All HCW have the responsibility to protect themselves from infectious diseases.[1] In previous studies for vaccines such as seasonal flu vaccines, hepatitis vaccines, and tetanus vaccines, it has been reported that health care workers do not want to be immunized for some reasons.[2,3]

A successful immunization program ensures the protection of health care professionals, their immediate environment, and the patients they are responsible for. It also reduces the cost of treatment while increasing epidemic control.[1] COVID-19 vaccines can be considered new vaccines. Although a large part of the society is vaccinated, antivaccine ideas and conspiracy theories are also shared from time to time in various social media channels.

Concerns about vaccination of HCW have been reported in previous studies.[4,5] The quick development of COVID-19 vaccines and the unknown long-term effects may cause hesitations about the vaccines.[5–7] No study has been conducted before that determines the COVID-19 vaccination rates of HCW according to demographic characteristics and that reveals their knowledge, attitudes, behaviors, and reasons for not being vaccinated.

This study aimed to reveal the real extent of the problem by determining the rate of vaccination of staff working in a university hospital against COVID-19.

Materials and Methods

The universe of our cross-sectional and descriptive study consisted of doctors, nurses, secretaries, interns, and other health care professionals working at Akdeniz University Faculty of Medicine Hospital between September 15 and November 15, 2021. Permission for this study was obtained from Akdeniz University Faculty of Medicine Clinical Research Ethics Committee (decision number 635; dated September 15, 2021). When the sample size was calculated with the simple random sampling method in the study population and 3,250 hospital employees were accepted as the population of the study, the required values were substituted in the formula and the minimum number of people to be collected was calculated as 688.

During the study, face-to-face interviews were conducted during the visits to the places of duty. While workers who gave written and verbal consent to participate in the study were included in the study, those who did not give consent or could not be on duty during the process were excluded from the study. As a data collection tool, a questionnaire form

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prepared by the researchers referring to the literature information was used.

A questionnaire form was prepared in the light of literature information.[3–5] The questionnaire used consisted of sociodemographic information, general information about vaccines, and questions determining attitudes and behaviors toward vaccines. A total of 29 questions were asked to the participants. Closed-ended and multiple-choice questions were asked in knowledge and behavior questions. A 3-point Likert scale consisting of "yes," "no," and "indecisive" response options was used for attitude questions.

Statistic

The data of the research were transferred to the SPSS IBM 22.0 (SPSS Inc, Chicago, IL) statistical program, and data control and analysis were performed in this program. The distribution of data was evaluated with the Kolmogorov–Smirnov test. The descriptive findings of the counted data were shown as frequency distribution and percentages; data that did not fit the normal distribution were expressed as median (minimum–maximum). Pearson's chi-square and Fisher's exact tests were used for the analysis of the hypothesis. Pearson's correlation test was used for continuous data analysis and Spearman's correlation test was used for discrete data. Values of $p < 0.05$ were considered statistically significant.

Results

At the time of the study, there were 3,250 registered personnel in Akdeniz University Faculty of Medicine Hospital. With the Epi Info program, it was concluded that 688 people should be reached at the 95% confidence interval.[8] Questionnaires were asked to 1,011 people, taking into account health care workers who would not agree to participate in the study. In total, 205 people who did not want to participate in the study for various reasons were excluded from the study. A total of 806 volunteers, 51.4% (414) male and 48.6% (392) female, with a mean age of 32.7 ± 9.3 years, were included in the study. Of the HCW included in the study, 95.4% (769) were vaccinated against COVID-19 at least once. During the vaccination period, 26.9% (217) of health care workers were diagnosed with COVID-19 at least once. The descriptive characteristics of the participants are summarized in ►**Table 1**.

Table 1 Descriptive characteristics of the participants

		N	%
Gender	Male	414	51.4
	Female	392	48.6
Marital status	Married	354	43.9
	Single	412	51.1
	Divorced	40	5.0
Child	Yes	335	41.6
	No	471	58.4
Level of education	High school	96	11.9
	University	469	58.2
	Master's degree	182	22.6
	Doctorate	59	7.3
Occupation	Doctor	155	19.2
	Nurse	134	16.6
	Intern	182	22.6
	Technician	103	12.8
	Secretary	60	7.4
	Auxiliary staff	142	17.6
	Other	30	3.7
Period of service	0–5 y	383	47.5
	6–10 y	155	19.2
	>10 y	268	33.3
Do you have any chronic diseases?	Yes	191	23.7
	No	615	76.3
Individual with chronic illness at home	Yes	237	29.4
	No	569	70.6
Individual over the age of 65 at home	Yes	121	15.0
	No	685	85,0
Which vaccine ($n = 787$)?	Sinovac	674	85,6
	BioNTech	113	14.4
How many doses have you been vaccinated ($n = 787$)?	1	13	1.6
	2	187	23.2
	3	374	46.4
	4	213	26.4

A considerable proportion (87.3% (704)) of HCW believe that COVID-19 vaccines are safe. Of the entire cohort, 25.3% (204) reported that government officials' vaccination in visual media affected the vaccination decision, while 29.5% (238) reported that news in the national media affected the vaccination decision. In addition, 60.8% (490) of the participants chose the option "having adequate emergency equipment in the vaccination center affects my decision to vaccinate." The attitudes of the participants about vaccination are given in ►**Table 2** in detail.

While the news in the national media affected the thoughts of 34.7% (267) of those who have been vaccinated, it has affected the thoughts of 40.5% (15) of those who have not been vaccinated. While 5.5% (42) of HCW with COVID-19 vaccine did not recommend their relatives/patients to be vaccinated, 32.4% (12) of HCW who were not vaccinated did not recommend vaccination to their relatives/patients ($p < 0.0001$).

The fact that the participants lived with an individual aged 65 years and over did not affect their decision to get vaccinated ($p = 0.88$). Similarly, when the vaccination status was examined in terms of occupation, no difference was found between occupations in terms of vaccination ($p = 0.590$). A comparison of vaccinated and unvaccinated groups is given in ►**Table 3**.

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Table 2 Distribution of attitudes about vaccination

	Yes (*n*, %)	No (*n*, %)	Indecisive (*n*, %)
Do you believe that people who have had COVID-19 should also be vaccinated?	671 (83.3)	57 (7.1)	78 (9.7)
Will state officials getting vaccinated in front of the media affect your vaccination decision?	204 (25.3)	539 (66.9)	63 (7.8)
Does the vaccination center having adequate equipment for emergency interventions affect your decision to be vaccinated?	490 (60.8)	248 (30.8)	68 (8.4)
Do you recommend your patients/relatives to be vaccinated against COVID-19?	716 (88.8)	54 (6.7)	36 (4.5)
Does the news on social media affect your thoughts on the effectiveness of the COVID-19 vaccine?	238 (29.5)	507(62.9)	61 (7.6)
News in the national media affects my thoughts on the effectiveness of the COVID-19 vaccine.	282 (35.0)	440 (54.6)	84 (10.6)
Does the fact that the vaccine was produced by a company in a country you trust affect your decision to be vaccinated?	505 (62.7)	242 (30.0)	59 (7.3)
Do you believe that COVID-19 vaccines are protective?	704 (87.3)	43 (5.3)	59 (7.4)

Table 3 Comparison of vaccinated and unvaccinated group

		Vaccinated ($n = 769$) (%)	Unvaccinated ($n = 37$) (%)	*p*
Gender	Male	389 (50.6)	25 (67.6)	0.044
	Female	380 (49.4)	12 (32.4)	
Marital status	Married	337 (43.8)	17 (45.9)	0.952
	Single	394 (51.2)	18 (48.6)	
	Divorced	38 (4.9)	2 (5.4)	
Comorbidity	Yes	187 (24.3)	4 (10.8)	0.038
	No	582 (75.7)	33 (89.2)	
Period of service	0–5 y	367 (47.7)	16 (43.2)	0.858
	6–10 y	147 (19.1)	8 (21.6)	
	>10 y	255 (33.2)	13 (35.2)	
Individual with chronic illness at home	Yes	229 (29.8)	8 (21.6)	0.191
	No	540 (70.2)	29 (78.4)	

Discussion

Since the COVID-19 pandemic was declared, many studies have been conducted for the treatment and prevention of the disease. Soon after the approval of the vaccines by the World Health Organization (WHO), Turkey first applied the inactivated vaccine (CoronaVac, Sinovac, Beijing, China) and then the BioNTech-Pfizer vaccine, an mRNA vaccine, to HCW and individuals in the risk group. It is known that effective vaccination programs both protect health care personnel and reduce hospital infections. In this study, in which we examined the attitudes and behaviors of health care professionals regarding COVID-19 vaccines, it was determined that a large majority (95.6%) of HCW had COVID-19 vaccines and a majority of them took the Sinovac vaccine. In addition, 98.3% of those who were vaccinated had received at least two or more doses.

Misinformation and conspiracy theories spread through social media can cause hesitancy against vaccines. The rates of acceptance to be vaccinated were between 55 and 90% in the study of Lazarus et al.[9] In the same study, it was reported that the vaccination recommendations of state officials would be followed at a high rate. In the study of Martin et al[10] in different ethnic origins, the vaccination rate of health care workers was determined as 64.5%. In our study, this rate was found to be higher. The reason for the higher rate in our study may be that we conducted the study in a more homogeneous ethnic group.

WHO defines vaccine hesitancy as a delay in accepting safe vaccines despite the availability of vaccine services.[11] Vaccine hesitancy is increasing worldwide, and WHO recognized it as one of the top 10 threats to global health in 2019.[9,12] In many countries, antivaccination and misinformation are seen as the

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biggest obstacles to successful immunization and community immunity.[9] In our study, it was determined that 29.5% of social media news and 35% of the news in the national media affect the decisions of HCW about vaccination.

It was reported that COVID-19 vaccine hesitancy is higher in women than in men.[13] In our study, more men than women are vaccinated against COVID-19. The low percentages of vaccinated women might reflect the wrong believe that COVID-19 vaccination may affect the chances of becoming pregnant. When we compare the groups who have and have not been vaccinated against COVID-19, it can be concluded that reasons such as comorbidity other than gender, working time in the hospital, and having a person with chronic disease at home did not affect vaccination. It is seen that the majority of the participants in our study had the Sinovac vaccine. We think that this may be due to the fact that Sinovac was the first vaccine brought to Turkey.

Our study has some limitations. First, our study was performed while the vaccination program was continuing. Therefore, the attitudes and behaviors of health care workers before the vaccination starts and the attitudes and behaviors adopted while the vaccination continues may be different. This issue should be taken into account when determining hesitations about vaccination in HCW. Another point is that the scientific knowledge of the participants was not measured. In addition, our study is single-centered and demonstrates the behaviors in our institution.

Conclusion

In conclusion, although male HCW have received more COVID-19 vaccines than female HCW, vaccination rates for HCW are at an acceptable level. HCW comply with the calendar recommended by the ministry. A majority of HCW believe that COVID-19 vaccines are protective.

Conflict of Interest
None declared.

References

1 Centers for Disease Control and Prevention. Immunization of health-care workers: recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC) [İnternet]. Available at: https://www.cdc.gov/mmwr/preview/mmwrhtml/00050577.htm
2 Galanakis E, Jansen A, Lopalco PL, Giesecke J. Ethics of mandatory vaccination for healthcare workers. Euro Surveill 2013;18(45): 20627
3 Karacaer Z, Ozturk I, Cicek H, Simsek S, Duran G, Gorenek L. The knowledge, attitudes and behaviors on immunization of health-care workers. Turk Silahli Kuvvetleri Koruyucu Hekim Bul 2015; 14(06):353
4 Paterson P, Meurice F, Stanberry LR, Glismann S, Rosenthal SL, Larson HJ. Vaccine hesitancy and healthcare providers. Vaccine 2016;34(52):6700–6706
5 Jain J, Saurabh S, Kumar P, et al. COVID-19 vaccine hesitancy among medical students in India. Epidemiol Infect 2021;149:e132
6 Khubchandani J, Sharma S, Price JH, Wiblishauser MJ, Sharma M, Webb FJ. COVID-19 vaccination hesitancy in the United States: a rapid national assessment. J Community Health 2021;46(02):270–277
7 Price S. COVID-19 vaccine hesitancy. Tex Med 2021;117(01):42–44
8 Carstensen B, Plummer M, Laara E, Hills M. Epi: A Package for Statistical Analysis in Epidemiology. R package version 2.44; 2021. Available at: https://CRAN.R-project.org/package=Epi
9 Lazarus JV, Ratzan SC, Palayew A, et al. A global survey of potential acceptance of a COVID-19 vaccine. Nat Med 2021;27(02):225–228
10 Martin CA, Marshall C, Patel P, et al. SARS-CoV-2 vaccine uptake in a multi-ethnic UK healthcare workforce: a cross-sectional study. PLoS Med 2021;18(11):e1003823
11 MacDonald NESAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. Vaccine 2015; 33(34):4161–4164
12 Larson HJ, Jarrett C, Eckersberger E, Smith DMD, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007-2012. Vaccine 2014;32(19):2150–2159
13 Robertson E, Reeve KS, Niedzwiedz CL, et al. Predictors of COVID-19 vaccine hesitancy in the UK household longitudinal study. Brain Behav Immun 2021;94:41–50

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