



ORIGINAL ARTICLE

Assessment of Knowledge, Attitude, and Acceptance of Healthcare Workers and Visitors Regarding COVID-19 Vaccines

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ABSTRACT

Background: vaccinations against COVID-19 are necessary to control the pandemic and prevent infections, nevertheless some people may be reluctant to get vaccinated due to unfavorable attitudes about the shot. **Objectives:** to compare the knowledge of healthcare workers and visitors regarding COVID-19 vaccines, to determine their attitudes, and to identify factors affecting acceptance toward COVID-19 vaccines. **methods:** This was a comparative cross-sectional study conducted on 110 comprising 55 healthcare workers and 55 Visitors of the dermatology and ophthalmology departments of Zagazig University hospitals from November 2022 to November 2023. The data were collected by a questionnaire, which was subsequently analyzed using SPSS 25 statistical software.

Results: About 70.9% of the health care workers group and (61.8%) of the visitors group were females in comparison to (29.1%) and (38.2%) were male healthcare workers visitors groups respectively. there was a highly statistically significant difference between groups as (63.6%) of the healthcare workers group had postgraduate higher education in comparison to only (5.5%) among the visitors group. (72.7%) of health care workers group received full doses of the COVID-19 vaccine unlike (47.3%) of the visitors group who received the vaccine, and (21.8%) and (41.8%) of health care workers and visitors groups respectively, did not receive COVID-19 vaccine, and this difference was statistically significantly different. Although healthcare workers were more knowledgeable, positive attitudes, and more acceptance regarding COVID-19 vaccines than visitors, there was no significant difference between them. **Conclusions:** This study was able to give a comprehensive overview of Egyptian knowledge, beliefs, and behaviors related to COVID-19. Healthcare workers have more knowledge, positive attitudes, and more acceptance than visitors regarding COVID-19 vaccines. **Keywords:** COVID-19; Knowledge; Attitude; Acceptance, Vaccine; Healthcare worker; visitors.

INTRODUCTION

The most successful intervention for preventing diseases that can be prevented by vaccination is vaccination. In the eleven months since the SARS-CoV-2 virus and its genome were discovered, an incredible amount of work has been done. Over 300 vaccination programs have been started with help from the scientific community. More than 40 novel vaccinations are presently undergoing clinical trials; some of these, including the Pfizer BioNTech and Moderna vaccines, have already been approved for use in numerous nations by the FDA for emergency use [1].

The World Health Organization (WHO) reports that as of June 24, 2021, 2,624,733,776 doses of COVID-19 vaccines had been administered worldwide. By June 23, 2021, 4,138,935 doses had been administered in Egypt [2].

The rate of coverage is a crucial determinant of immunization success. The process of developing vaccines used to take years. Therefore, even if a new COVID-19 vaccine has been created quickly, the public's acceptability of it is yet unknown [3,4].

"The delay in acceptance or refusal of vaccination despite the availability of vaccination services" is the definition of vaccine hesitancy given by the WHO's SAGE (Strategic Advisory Group of Experts on Immunization) working group [5]. It is found on a continuum ranging from total rejection to total acceptance [5]. Two of the ten hazards to world health in 2019 that the WHO highlighted were low vaccination adoption and the possibility of a pandemic [6].

Concerns over the safety and potential adverse effects of the COVID-19 vaccinations that were released in an emergency setting, as

well as the rapidity of their development and approval, may be the causes of reluctance [7]. Patients view healthcare professionals as trustworthy sources of information and as role models when it comes to vaccinations [8], so their acceptance or refusal of the COVID-19 vaccine, or their reluctance to get it, will have a significant impact on the attitude of the general population toward the COVID-19 vaccine uptake. This is because people typically rely on the advice and actions of their healthcare professionals to help them make decisions [9].

The study aim was improving the level of the immunity in the community by increasing vaccination coverage. And the objectives of the study to compare knowledge of healthcare workers and visitors regarding COVID-19 vaccines, to determine attitude of them and to identify factors that affect acceptance regarding COVID-19 vaccines.

METHODS

Study design and setting:

Comparative cross-sectional study, the study was conducted in Zagazig university hospitals, Sharkia governorate, from Novembre 2022 to Novembre 2023.

Study subjects:

The study included Health care workers and visitors of dermatology and ophthalmology departments of Zagazig university hospitals.

The EPI 7™ (info program) was used to calculate the sample size according to the following [10]:

110 comprising 55 health care workers and 55 Visitors ;64.7% of doctors with positive attitude towards COVID -19 vaccine versus 34.5% of Visitors at 95% confidence interval, power 80%, with non-response rate 10%.

We used a multistage random sampling technique for sample selection. There are 25 clinical departments in Zagazig university

hospitals, 13 medical departments and 12 surgical departments.

- First phase: we chose two departments, one medical and one surgical department by simple random sampling technique. (Dermatology and ophthalmology).
- Second stage health care workers were selected according to their proportional allocation in departments of Dermatology and Ophthalmology that equal 1: 2 by simple random technique and visitors were selected according to their attendance and as proportion of Dermatology department and Ophthalmology department equal 40%: 60% by systematic sample technique.

Inclusion criteria:

All Health care workers in dermatology and ophthalmology departments of Zagazig university hospitals (These include frontline healthcare workers, such as nurses, physicians, pharmacists, laboratory professionals and other non-health professionals, such as finance officers, human resources personnel, cleaners, and guardians.) visitors of dermatology and ophthalmology departments of Zagazig university hospitals.

Both sexes

Exclusion criteria:

- 1- mental or psychological problems.
- 2- communication problems.

Data collection tool:

The questionnaire took about 10-15 minutes to be completed. It consisted of the following parts:

1) first part contains:

A) Sociodemographic questionnaire to assess their social characteristics including: (age- gender-marital status- residence-level of education – occupation) Moreover, questions about any health problem.

B) Some other questions related to COVID 19 disease and vaccines history [11]:

(Having any chronic diseases, Pregnancy Status (for females), working in the medical Sector or Isolation Covid19 Hospitals, History of COVID-19 infection for them and their family, receiving Influenza vaccine, having regularly and fully vaccinated in accordance with the routine vaccination program for yourself or any family member, missing some vaccines, COVID 19 vaccines (receiving it or not, causes of refusing to take, having any information about them, Source of information about COVID vaccines).

2) Second part contains:

Assessment of knowledge [12]:

To assess the COVID - 19 - related knowledge of the participants, 10 questions having 3 choices were prepared: (can it prevent the disease? -can it decrease severity or complication? -relation between vaccines and importance of getting a booster dose of COVID-19 vaccines-vaccines and pregnancy -efficacy of vaccines against the new variants of the virus, Highly feverish people shouldn't receive vaccine, previously infected COVID-19 shouldn't receive the vaccine).

3) The third part contains:

- Assessment of attitude [12]: to evaluate the participants' attitudes, 15 questions having 3 choices were prepared: (is it effective to prevent the disease or not? -is it effective to reduce serious illness and death or not? - would vaccines produce immunity against COVID infection? - should everyone receive the vaccines? – may vaccines cause allergic reaction or severe side effects? - if receiving the vaccine will make them reduce precautionary measures? -is it possible to catch COVID 19 infection after vaccination? – is it important to take the booster dose of the vaccine to keep them immune?)

4) The fourth part contains [13]:

- Assessment of acceptance:

To evaluate the participants' acceptance, 8 items were prepared: (What is your level of acceptance for the COVID-19 vaccine if generally available? - What is your level of acceptance for COVID-19 vaccine? - Do you think your doctor or healthcare provider would recommend that you get the covid-19 vaccine? - How important is it to you that getting the Covid-19 vaccine would protect your health? -willing to be to be a volunteer for a clinical trial for a Covid-19 vaccine. Concerns you have about volunteering in a clinical trial for the COVID-19 vaccine).

Scoring systems: Knowledge score was calculated for the 10 knowledge questions; with the maximum score to be 20. The attitude score was calculated: for the 17 attitude questions; (with a maximum score of 34). two acceptance scores were calculated :(with a maximum score of 19). These scores were used to be compared between participants according to the characters studied.

Adequacy of total score for each subject was calculated as follow:

Cut off at 70% or more in each section of survey is considered for adequate knowledge, attitude, practice, or Acceptance [11].

STATISTICAL ANALYSIS

The collected data were coded, entered, presented, and analyzed by computer using a database software program SPSS (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp). Normality test of data was checked using Shapiro-Wilk test. Qualitative data were represented as frequencies and percentages. The chi-square test was used to detect the relation between different qualitative variables. P value < 0.05 was considered statistically significant and < 0.001 was considered as highly statistically significant.

RESULTS

This study was conducted on 110 participants divided into 2 groups: 55 healthcare workers and 55 visitors; **table (1)** showed that (70.9%) of healthcare workers group and (61.8%) of visitors group were females in comparison to (29.1%) and (38.2%) were male respectively, 34.55% of healthcare workers were in the age group 18-30 in comparison to 49.1% of visitors, there was a highly statistically significant difference between groups as (63.6%) of health care workers group had postgraduate higher education in comparison to only (5.5%) among visitors group. Also, (94.5%) of the healthcare workers group had a governmental occupation in comparison to only (21.8%) among the visitor's group. (50.9%) of the health care group had children under 12 years old in comparison to 17 participants (30.9%) among the visitors group.

Table (2): It was found that the healthcare workers were more knowledgeable than the visitors as regards the following items: COVID vaccines decrease severity or complication, help to build immunity, are contraindicated in pregnant females and feverish people, COVID-19 vaccines are not effective against the new variants of the virus. There was no significant difference between the groups as regards COVID-19 vaccines can prevent disease, immunity after vaccination is time-limited, there is no need to get a booster dose of the vaccine, the vaccines are contraindicated in chronic disease patients and previously COVID-19 shouldn't receive the vaccine.

Table (3) shows that (45.5%) of healthcare workers agreed that getting immunity after infection is better than vaccination, unlike (52.7%) of the visitors group had an uncertain attitude. The majority of healthcare workers and visitors agreed that the COVID-19

vaccine may cause allergic reactions, accounting for (72.7%) and (69.1%) respectively, while (16.4%) of healthcare workers groups and (1.8%) of visitors group do not agree about that . (40%) of healthcare workers would not reduce precautionary measures if they received the vaccine, in comparison to only (18.2%) of visitors group .Also, (40%) of health care workers think that no need of the vaccine if they got infected, in comparison to (27.3%) of visitors group .And ,(72.7%) of health care workers agreed that COVID-19 vaccines not effective against new variants, in comparison to only (54.5%) of visitors group .

Table (4): showed that; there was no significant difference between the two groups regarding acceptance toward COVID-19 vaccines except (90.9%) of health workers groups didn't want to be a volunteer for medical trial for COVID-19 vaccine. The main cause of refusing to be a volunteer for a clinical trial for a COVID-19 vaccine was that

Vaccine might be unsafe, HCWs by (66 %) and Visitors by (61.8 %).

Figure 1: showed that healthcare workers had good knowledge, positive attitude, and more acceptance regarding COVID-19 vaccines.

Table 5: showed that there was no significant difference between total knowledge score and total attitude score and total acceptance score and socio demographic characteristics of the studied groups except residence of participants associated with significant difference, as (63.2 %) of participants who didn't accept to receive vaccine were from rural areas in comparison to (36.8 %) of participants who accept to receive the vaccine .Occupation of participants associated with significant difference, as (76 %) of participants who didn't accept to receive vaccine were Unemployed in comparison to (24%) of participants who accept to receive the vaccine

Table 1: Frequency distribution of characteristics of the studied groups:

		Health care workers (NO=55) N. (%)	Visitors (NO=55) N. (%)	P-value
1-	Age (years)			
	18-30	19 (34.55%)	27 (49.1%)	0.123
	31-40	18 (32.73%)	10 (18.2%)	
	41-50	8 (14.54%)	5 (9.1%)	
	>50	10 (18.18%)	13 (23.6%)	
2-	Sex			
	Male	16 (29.1%)	21 (38.2%)	0.420
	Female	39 (70.9%)	34 (61.8%)	
3-	Marital status			
	Single	9 (16.4%)	17 (30.9%)	0.075
	Married	46 (83.6%)	38 (69.1%)	
4-	Residence			
	Rural	20 (36.4%)	48 (87.3%)	* <0.001
	Urban	35 (63.6%)	7 (12.7%)	

		Health care workers (NO=55) N. (%)	Visitors (NO=55) N. (%)	P-value
5-	Educational status			
	Primary	2 (3.64%)	2 (3.6%)	* <0.001
	Preparatory	0 (0%)	1 (1.8%)	
	Secondary	10 (18.18%)	25 (45.5%)	
	University	8 (14.54%)	24 (43.6%)	
	Postgraduate	35 (63.64%)	3 (5.5%)	
6-	Occupation			
	Non-employed	0 (0%)	25 (45.5%)	* <0.001
	Student	0 (0%)	3 (5.5%)	
	Irregular	0 (0%)	3 (5.5%)	
	Farmer/ worker	3 (5.5%)	1 (1.8%)	
	Private work	0 (0%)	11 (20%)	
	Governmental	52 (94.5%)	12 (21.8%)	
7-	Associated co-morbidities.			
	Absent	43 (78.2%)	45 (81.8%)	0.634
	Present	12 (21.8%)	10 (18.2%)	
8-	Pregnancy status			
	Pregnant	4 (10.3%)	4 (11.8%)	1.00
	Non-pregnant	35 (89.7%)	30 (88.2%)	
9-	Having children <12 ys old			
	No	27 (49.1%)	38 (69.1%)	* 0.03
	Yes	28 (50.9%)	17 (30.9%)	

Test of significance: Chi-square test. * P-value is considered significant if <0.05.

Table 2: Comparison of knowledge level regarding COVID-19 vaccines among studied groups

		Health care workers (NO=55) N. (%)	Visitors (NO=55) N. (%)	P-value
1-	COVID vaccines can prevent disease			
	No	26 (47.3%)	18 (32.7%)	0.132
	Don't know	6 (10.9%)	13 (23.6%)	
	Yes	23 (41.8%)	24 (43.6%)	
2-	COVID vaccines decrease severity or complication			
	No	4 (7.3%)	2 (3.6%)	* 0.002
	Don't know	1 (1.8%)	13 (23.6%)	
	Yes	50 (90.9%)	40 (72.7%)	
3-	The vaccine helps to build immunity			
	No	12 (21.8%)	11 (20%)	* 0.011
	Don't know.	4 (7.3%)	16 (29.1%)	
	Yes	39 (70.9%)	28 (50.9%)	
4-	Immunity after vaccination is time limited			
	No	5 (9.15)	9 (16.4%)	0.202
	Don't know.	13 (23.6%)	18 (32.7%)	
	Yes	37 (67.3%)	28 (50.9%)	

		Health care workers (NO=55) N. (%)	Visitors (NO=55) N. (%)	P-value
5-	There is no need to get a booster dose of COVID-19 vaccine			
	No	20 (36.4%)	13 (23.6%)	0.057
	Don't know.	10 (18.2%)	21 (38.2%)	
Yes	25 (45.5%)	21 (38.2%)		
6-	COVID vaccines are contraindicated in pregnant			
	No	35 (63.6%)	44 (80%)	*
	Don't know	6 (10.9%)	8 (14.5%)	0.015
7-	COVID vaccines are contraindicated in chronic disease patients			
	No	23 (41.8%)	30 (54.5%)	0.284
	Don't know	7 (12.7%)	8 (14.5%)	
Yes	25 (45.5%)	17 (30.9%)		
8-	Highly feverish people shouldn't receive vaccine			
	No	1 (1.8%)	5 (9.1%)	*
	Don't know	0 (0%)	15 (27.3%)	<0.001
9-	Previously infected COVID-19 shouldn't receive the vaccine			
	No	16 (29.1%)	20 (36.4%)	0.129
	Don't know	7 (12.7%)	13 (23.6%)	
Yes	32 (58.2%)	22 (40%)		
10-	COVID 19 vaccines aren't effective against the new variants of the virus			
	No	10 (18.2%)	7 (12.7%)	*
	Don't know	7 (12.7%)	26 (47.3%)	<0.001
	Yes			
		38 (69.1%)	22 (40%)	

Test of significance: Chi-square test. * P-value is considered significant if <0.05.

Table 3: Comparison of attitude level regarding COVID-19 vaccines among studied groups

		Health care workers (NO=55) N. (%)	Visitors (NO=55) N. (%)	P-value
1-	The vaccine is effective in preventing the disease			
	Don't agree	6 (10.9%)	9 (16.4%)	0.554
	Borderline	21 (38.2%)	23 (41.8%)	
Agree	28 (50.9%)	23 (41.8%)		
2-	The vaccine is effective in reducing risk of developing serious illness and death			
	Don't agree	5 (9.1%)	11 (20%)	0.214
	Borderline	16 (29.1%)	17 (30.9%)	
Agree	34 (61.8%)	27 (49.1%)		
3-	Vaccines would produce immunity against COVID infection			
	Don't agree	11 (20%)	5 (9.1%)	0.054
	Borderline	10 (18.2%)	20 (36.4%)	
Agree	34 (61.8%)	30 (54.5%)		
4-	Everyone should receive the vaccine			
	Don't agree	12 (21.8%)	15 (27.3%)	0.058
	Borderline	15 (27.3%)	24 (43.6%)	
Agree	28 (50.9%)	16 (29.1%)		

		Health care workers (NO=55) N. (%)	Visitors (NO=55) N. (%)	P-value
5-	Getting immunity after infection is better than vaccination			
	Don't agree	17 (30.9%)	10 (18.2%)	* 0.007
	Borderline	13 (23.6%)	29 (52.7%)	
Agree	25 (45.5%)	16 (29.1%)		
6-	COVID-19 vaccines may cause allergic reaction			
	Don't agree	9 (16.4%)	1 (1.8%)	* 0.004
	Borderline	6 (10.9%)	16 (29.1%)	
Agree	40 (72.7%)	38 (69.1%)		
7-	COVID-19 vaccines may cause severe side effects			
	Don't agree	5 (9.1%)	2 (3.6%)	0.228
	Borderline	7 (12.7%)	13 (23.6%)	
Agree	43 (78.2%)	40 (72.7%)		
8-	Receiving the vaccine will not make me reduce precautionary measures			
	Don't agree	22 (40%)	10 (18.2%)	0.012*
	Borderline	16 (29.1%)	30 (54.5%)	
Agree	17 (30.9%)	15 (27.3%)		
9-	In my country COVID-19 vaccines are not effective or safe			
	Don't agree.	27 (49.1%)	31 (56.4%)	0.209
	Borderline	13 (23.6%)	6 (10.9%)	
Agree	15 (27.3%)	18 (32.7%)		
10-	No need of the vaccine if I got the infection			
	Don't agree	25 (45.5%)	20 (36.4%)	* 0.03
	Borderline	8 (14.5%)	20 (36.4%)	
Agree	22 (40%)	15 (27.3%)		
11-	It is possible to catch COVID- 19 infection even after vaccination			
	Don't agree	3 (5.5%)	3 (5.5%)	0.06
	Borderline	6 (10.9%)	16 (29.1%)	
Agree	46 (83.6%)	36 (65.5%)		
12-	Booster dose of COVID-19 vaccine is important to keep me immune			
	Don't agree	9 (16.4%)	6 (10.9%)	0.706
	Borderline	18 (32.7%)	19 (34.5%)	
Agree	28 (50.9%)	30 (54.5%)		
13-	COVID vaccines are not effective against new variants of the virus			
	Don't agree	8 (14.5%)	5 (9.1%)	* 0.015
	Borderline	7 (12.7%)	20 (36.4%)	
Agree	40 (72.7%)	30 (54.5%)		
14-	Recommending their family members to take COVID-19 vaccines			
	Don't agree.	8 (14.5%)	12 (21.8%)	0.537
	Borderline	14 (25.5%)	15 (27.3%)	
Agree	33 (60%)	28 (50.9%)		
15-	COVID vaccines should be mandatory to all people			
	Don't agree.	21 (38.2%)	20 (36.4%)	0.260
	Borderline	10 (18.2%)	17 (30.9%)	
Agree	24 (43.6%)	18 (32.7%)		

Test of significance: Chi-square test. * P-value is considered significant if <0.05.

Table 4: Comparison of acceptance level regarding COVID-19 vaccines among studied groups

		Health care workers (NO=55) N. (%)	Visitors (NO=55) N. (%)	P-value
1-	Level of acceptance for COVID-19 vaccine if generally available			
	Don't agree totally	6 (10.9%)	10 (18.2%)	0.061
	To some extent don't agree	5 (9.1%)	9 (16.4%)	
	Borderline	19 (34.5%)	15 (27.3%)	
	Agree	23 (41.8%)	13 (23.6%)	
Totally agree	2 (3.6%)	8 (14.5%)		
2-	Level of acceptance for COVID-19 vaccine if the manger recommended it			
	Don't agree totally	10 (18.2%)	10 (18.2%)	0.152
	To some extent don't agree	4 (7.3%)	11 (20%)	
	Borderline	15 (27.3%)	12 (21.8%)	
	Agree	22 (40%)	14 (25.5%)	
Totally agree	4 (7.3%)	8 (14.5%)		
3-	Your doctor or health care provider would recommend that you get the covid-19 vaccine			
	No	9 (16.4%)	9 (16.4%)	1.00
	Yes	46 (83.6%)	46 (83.6%)	
4-	Covid-19 vaccine protects the health of people who get vaccinated			
	Not important at all	6 (10.9%)	8 (14.5%)	0.715
	Important a little	19 (34.5%)	21 (38.2%)	
	Important	30 (54.5%)	26 (47.3%)	
5-	Covid-19 vaccine protects the health of family members and friends			
	Not important at all	6 (10.9%)	7 (12.7%)	0.747
	Important a little	18 (32.7%)	21 (38.2%)	
	Important	31 (56.4%)	27 (49.1%)	
6-	Covid-19 vaccine protects the health of the community			
	Not important at all	6 (10.9%)	7 (12.7%)	0.631
	Important a little	17 (30.9%)	21 (38.2%)	
	Important	32 (58.2%)	27 (49.1%)	
7-	Willing to be to be a volunteer for a clinical trial for a COVID-19 vaccine			
	Don't want	50 (90.9%)	43 (78.2%)	* 0.019
	Not sure	3 (5.5%)	12 (21.8%)	
	Want to	2 (3.6%)	0 (0%)	
8-	Concerns about volunteering in a clinical trial for COVID-19 vaccine			
	Vaccine might be unsafe	37 (67.3%)	34 (61.8%)	0.489
	Had health problems	10(18.2%)	8 (14.5%)	
	Don't trust scientist	2 (3.6%)	6 (10.9%)	
	Others	6 (10.9%)	7 (12.7%)	

Test of significance: Chi-square test. * P-value is considered significant if <0.05.

Table 5: Relation between total knowledge score, total attitude score and total acceptance score and socio demographic characteristics of the studied groups

	Good knowledge (NO=49)	Positive attitude (NO=45)	More acceptance (NO=49)
Age (years) (N. %)			
18-30	19 (41.3%)	20 (43.5%)	21 (45.7%)
31-40	11 (39.3%)	11 (39.3%)	11 (39.3%)
41-50	6 (46.2%)	4 (30.8%)	7 (53.8%)
51-60	12 (60%)	9 (45%)	9 (45%)
>60	1 (33.3%)	1 (33.3%)	1 (33.3%)
P value	0.6	0.9	0.922
Sex (N. %)			
Male	16 (43.2%)	17 (45.9%)	20 (54.1%)
Female	33 (45.2%)	28 (38.4%)	29 (39.7%)
P value	0.8	0.4	0.153
Marital status (N. %)			
Single	10 (38.5%)	10 (38.5%)	9 (34.6%)
Married	38 (45.8%)	34 (41%)	39 (47%)
Widow	1 (100%)	1 (100%)	1 (100%)
P value	0.5	0.5	0.261
Residence (N. %)			
Rural	28 (41.2%)	28 (41.2%)	25 (36.8%)
Urban	21 (50%)	17 (40.5%)	24 (57.1%)
P value	0.4	0.9	0.037 *
Educational status (N. %)			
Primary	3 (75%)	1 (25%)	1 (25%)
Preparatory	1 (100%)	1 (100%)	1 (100%)
Secondary	11 (31.4%)	10 (28.6%)	11 (31.4%)
University	13 (40.6%)	15 (46.9%)	13 (40.6%)
Postgraduate	21 (55.3%)	18 (47.4%)	23 (60.5%)
P value	0.1	0.2	0.055
Occupation (N. %)			
Non-employed	10 (40%)	8 (32%)	6 (24%)
Student	2 (66.7%)	2 (66.7%)	2 (66.7%)
Irregular	1 (33.3%)	3 (100%)	2 (66.7%)
Farmer	2 (50%)	1 (25%)	1 (25%)
Private work	4 (36.4%)	3 (27.3%)	3 (27.3%)
Governmental	30 (46.9%)	28 (43.8%)	35 (54.7%)
P value	0.9	0.2	0.045 *
Working in medical sector			
No	22 (40%)	22 (40%)	20 (36.4%)
Yes	27 (49.1%)	23 (41.8%)	29 (52.7%)
P value	0.3	0.8	0.084
Previous COVID-19 inf.			
No	28 (53.8%)	25 (48.1%)	28 (53.8%)
Maybe	10 (43.5%)	8 (34.8%)	10 (43.5%)
Yes	11 (31.4%)	12 (34.3%)	11 (31.4%)
P value	0.1	0.4	0.118

Test of significance: Chi-square test. * *P*-value is considered significant if <0.05.

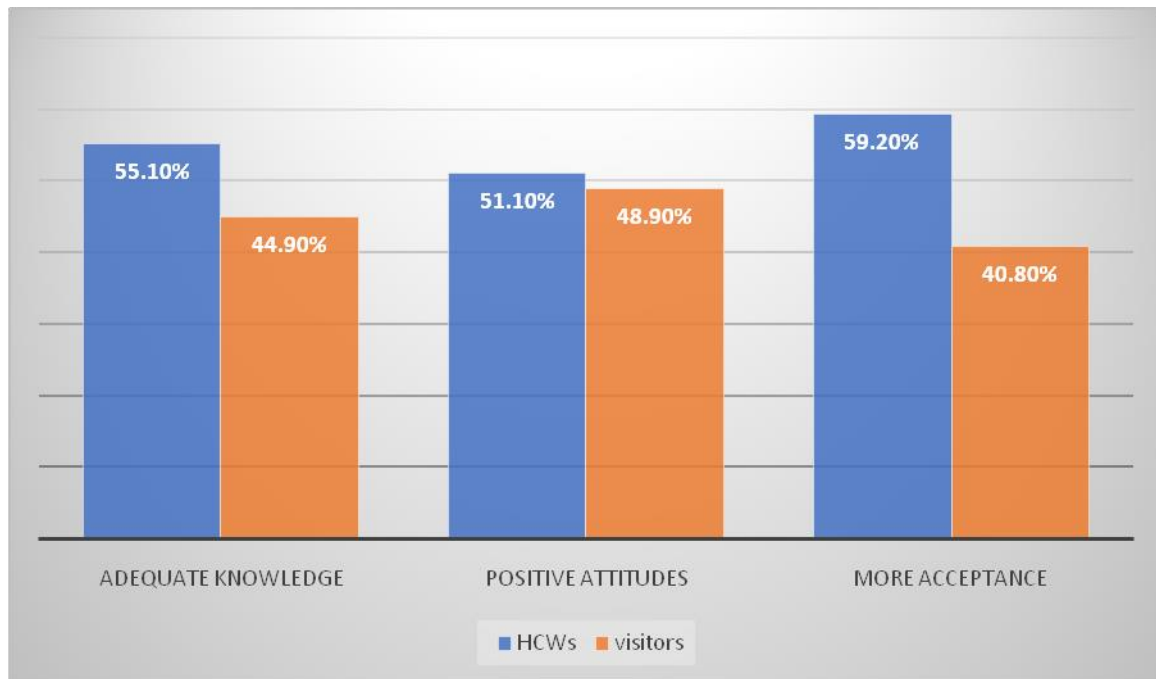


Figure 1: Comparison between healthcare workers and visitors as regards total knowledge, attitude, and acceptance

DISCUSSION

One of the most crucial public health initiatives to reduce the death rate and stop the spread of some infectious illnesses is vaccination. According to estimates from the World Health Organization (WHO), vaccines prevented at least 10 million lives between 2010 and 2015. Globally, significant immunization rates are required to halt the COVID-19 epidemic. Numerous organizations worldwide have undertaken extensive studies since the new coronavirus's discovery in an effort to develop a vaccine that will effectively and safely shield humans from this deadly illness[14].

The healthcare workers were more knowledgeable than the visitors as regards the following items: COVID vaccines decrease severity or complication, helps to build immunity these result are consistent with Elhadi et al. [11] and Al-Metwali et al. [15](Table 2).

About 63.6% of healthcare workers don't agree that COVID-19 vaccines are

contraindicated in pregnancy in comparison to 80% of visitors, these results consistent with Marín-Cos et al. [16]revealed the apprehension and discomfort experienced by healthcare professionals in endorsing the COVID-19 vaccination in the absence of adequate scientific proof derived from clinical studies.Numerous ongoing modifications to medical procedures and vague guidelines have decreased HCW confidence in suggestions and made them feel uneasy about making them (Table 2).

About 45.5% of healthcare workers and 30.9% of visitors agreed that COVID vaccines are contraindicated in chronic disease patients. This might be due to fear of side effects, contraindication due to the existing chronic disease(s), or lack of trust in the available vaccines.in contrast with Poon et al. [17]Just 52.9% of respondents said they would proactively talk with patients about COVID-19 immunizations, compared to 64.4% who would advise all patients without contraindications to the vaccination (Table 2).

69.1% of healthcare workers agreed that COVID-19 vaccines aren't effective against the new variants of the virus in comparison to 40% of visitors, these results are consistent with Pal et al. [18] revealed that nearly two-thirds (63.6%) of respondents who worked in the healthcare expressed concern that the present immunization might not be effective against emerging strains of (Table 2).

About (45.5%) of healthcare workers agreed that getting immunity after infection is better than vaccination, unlike (52.7%) of visitors group had uncertain attitude. These results consistent with Hall et al. [19] who calculated the effectiveness of vaccines against all infections, including asymptomatic infections with little clinical significance; a decline in vaccine efficacy against infection will raise the risk of infection and transmission to high-risk individuals, some of whom may progress to serious illness. and in contrast with recent research, immunization provides longer-lasting protection against serious hospital outcomes and mortality than both symptomatic and asymptomatic infection [20,21] (Table 3).

Our study showed that 78.2% of healthcare workers and 72.2% of visitors agreed that COVID-19 vaccines may cause severe side effects, in consistent with Mohammed et al. [22] and Saied et al. [23] studies, we found that more than half of medical students (51%) and (56.3%) respectively are afraid of unknown side effects of the COVID-19 vaccine. The negative effects of the COVID-19 vaccine caused our participants to express great anxiety, which contrasts with the high vaccination uptake rates. Research indicates that it's critical to focus on fostering confidence in vaccinations through openness and expectation management, as well as on fostering trust in COVID-19 vaccines by

enlisting the help of reliable partners to help traverse the COVID-19 information paradigm (Table 3).

In line with participants' anticipated perceptions of COVID-19 vaccinations, When Mohammed et al. [22] asked participants what they thought would be the best approach to handle vaccines in Sudan, only 31.9% of healthcare professionals said they thought vaccinations should be voluntary for the entire population. This is less than the 56.7% of respondents in the Qunaibi et al. [24] multinational study who answered the same question. But our study showed that 43.6% of healthcare workers agreed that COVID vaccines should be mandatory to all people (Table 3).

(90.9%) of health workers groups didn't want to be a volunteer for medical trial for COVID-19 vaccine, The main cause of refusing to be a volunteer for a clinical trial for a COVID-19 vaccine was that Vaccine might be unsafe, HCWs by (66 %) and Visitors by (61.8 %). these result in contrast with Detoc et al. [25] who demonstrated that about half of the respondents would consent to take part in a clinical study for the COVID-19 vaccination. Men also tended to engage more frequently in clinical trials. There was no correlation found between the desire to take part in a clinical study and COVID-19-related fears. On the other hand, people who thought they were at-risk for COVID-19 infection were more likely to agree to take part in a vaccination research study (Table 4).

Although healthcare workers had good knowledge, positive attitudes and more acceptance regarding COVID-19 than visitors, there was no significant difference between them. in consistency with Elhadi et al. [11] who showed that although medical professionals and students accepted the

COVID-19 vaccine more, there was no statistically significant difference in this regard between the public, medical students, and healthcare professionals like physicians and nurses. This suggests that vaccination is preferred by all populations, suggesting that people are generally eager to get the shot. In contrast with Mohammed et al. [22] discovered that there were notable differences between the groups in terms of acceptance, attitude, and knowledge. Their bigger sample size might help to explain this (Figure 1).

There was no significant difference between total knowledge score and socio-demographic characteristics of the studied groups. These results in contrast with Al-katana et al. [26] who demonstrated that participants with higher education (bachelor degree or above) had higher knowledge scores than participants with lower education, younger participants had better knowledge than older participants, and participants with higher education had higher knowledge scores than participants with lower education (Table 5).

There was no significant difference ($P > 0.05$) between total attitude score and socio-demographic characteristics of the studied groups. These results in contrast with Ciardi et al. [27] revealed that women made up 66% of survey respondents. We also saw a notable male predominance among those who were willing to get vaccinated. A topic recently covered by Adhikari et al. [28], healthcare professionals who lived in Manhattan were more receptive to vaccinations than those who lived in the Bronx, suggesting that home location may potentially influence vaccine attitudes (Table 2).

Regarding residence of participants, there was significant difference, as (63.2 %) of participants who didn't accept to receive vaccine were from rural areas in comparison

to (36.8%) of participants who accept to receive the vaccine. In consistency with Tharwat et al. [29] discovered that participants from cities had higher vaccine acceptance rates (Table 5).

Occupation of participants associated with significant difference, as (76 %) of participants who didn't accept to receive vaccine were Unemployed in comparison to (24%) of participants who accept to receive the vaccine. In consistent with Malik et al. [30] who demonstrated that participants without jobs reported a decreased acceptance rate for the COVID-19 vaccination. And in contrast with Guo et al. [31] discovered that, at the population level, unemployment has no discernible effect on COVID-19 immunization rates between BIPOC and non-BIPOC persons. It's interesting to note that BIPOC people were more likely to experience unemployment during the COVID-19 pandemic [32], which may have prompted them to get vaccinated against the virus in order to rejoin the workforce [33] (Table 5).

Like our result: Tharwat et al. [29] discovered no differences in terms of age, gender, or experience caring for COVID-19 patients. In contrast with previous studies by İkişik et al. [34], Khamis et al. [35], and Papini et al. [36] It was noted that doctors and men accepted immunizations more than nurses and women did. Consequently, doctors contribute significantly to raising public acceptance of the COVID-19 vaccine (Table 5).

CONCLUSIONS

Considering the ongoing COVID-19 pandemic, our study revealed the knowledge, attitudes, and acceptability about the pandemic as well as the COVID-19 vaccine among Egyptians. In-depth information about Egyptian knowledge, beliefs, and behaviors

related to COVID-19 could be obtained from the current study. Healthcare workers have more knowledge and positive attitudes than visitors regarding COVID-19 vaccines. We suggest tackling the public's worries, spreading knowledge about COVID-19 vaccination as a disease-control strategy, dispelling conspiracy theories, encouraging vaccination without fear, and stepping up efforts to supply vaccines in underdeveloped nations like Egypt and other African nations. larger sample sizes will be needed for future research to yield meaningful findings.

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Conflict of interest statement

The authors of this article all declare that they have no competing interests.

REFERENCES

- 1-Forni G, Mantovani A; COVID-19 Commission of Accademia Nazionale dei Lincei, Rome. COVID-19 vaccines: where we stand and challenges ahead. *Cell Death Differ.* 2021;28(2):626-39.
- 2-Hancher-Rauch HL, Bishop C, Campbell A, Cecil K, Yazel L. Effects of COVID-19 Pandemic on the Professional Roles and Responsibilities of Health Educators. *Health PromotPract.* 2021;22(2):156-62.
- 3-Solís Arce JS, Warren SS, Meriggi NF, Scacco A, McMurry N, Voors M, et al. COVID-19 vaccine acceptance and hesitancy in low- and middle-income countries. *Nat Med.* 2021;27(8):1385-94.
- 4-Troiano G, Nardi A. Vaccine hesitancy in the era of COVID-19. *Public Health.* 2021;194:245-51.
- 5-Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, et al. A global survey of potential acceptance of a COVID-19 vaccine. *Nat Med.* 2021;27(2):225-8.
- 6-Adil MT, Rahman R, Whitelaw D, Jain V, Al-Ta'an O, Rashid F, et al. SARS-CoV-2 and the pandemic of COVID-19. *Postgrad Med J.* 2021;97(1144):110-6.
- 7-Shekh R, Sheikh AB, Upadhyay S, Singh M, Kottewar S, Mir H, et al. COVID-19 Vaccine Acceptance among Health Care Workers in the United States. *Vaccines (Basel).* 2021;9(2):119.
- 8-Deem MJ. Nurses' Voices Matter in Decisions About Dismissing Vaccine-Refusing Families. *Am J Nurs.* 2018;118(8):11.
- 9-Shaw J, Stewart T, Anderson KB, Hanley S, Thomas SJ, Salmon DA, et al. Assessment of US Healthcare Personnel Attitudes Towards Coronavirus Disease 2019 (COVID-19) Vaccination in a Large University Healthcare System. *Clin Infect Dis.* 2021;73(10):1776-83.
- 10-Lindner-Pawlowicz K, Mydlikowska-Śmigórska A, Łampika K, Sobieszcańska M. COVID-19 Vaccination Acceptance among Healthcare Workers and General Population at the Very Beginning of the National Vaccination Program in Poland: A Cross-Sectional, Exploratory Study. *Vaccines (Basel).* 2021;10(1):66.
- 11-Elhadi M, Alsoufi A, Alhadi A, Hmeida A, Alshareea E, Dokali M, et al. Knowledge, attitude, and acceptance of healthcare workers and the public regarding the COVID-19 vaccine: a cross-sectional study. *BMC Public Health.* 2021;21(1):955.
- 12-Al-Zalfawi SM, Rabbani SI, Asdaq SMB, Alamri AS, Alsanie WF, Alhomrani M, et al. Public Knowledge, Attitude, and Perception towards COVID-19 Vaccination in Saudi Arabia. *Int J Environ Res Public Health.* 2021;18(19):10081.
- 13-Reiter PL, Pennell ML, Katz ML. Acceptability of a COVID-19 vaccine among adults in the United States: How many people would get vaccinated?. *Vaccine.* 2020;38(42):6500-7.
- 14-Altman DM, Boyton RJ. COVID-19 vaccination: The road ahead. *Science.* 2022;375(6585):1127-32.

- 15-**Al-Metwali BZ, Al-Jumaili AA, Al-Alag ZA, Sorofman B.** Exploring the acceptance of COVID-19 vaccine among healthcare workers and general population using health belief model. *J Eval Clin Pract.* 2021;27(5):1112-22.
- 16-**Marín-Cos A, Marbán-Castro E, Nedic I, Ferrari M, Crespo-Mirasol E, Ventura LF, et al.** "Maternal Vaccination Greatly Depends on Your Trust in the Healthcare System": A Qualitative Study on the Acceptability of Maternal Vaccines among Pregnant Women and Healthcare Workers in Barcelona, Spain. *Vaccines (Basel).* 2022;10(12):2015.
- 17-**Poon PKM, Zhou W, Chan DCC, Kwok KO, Wong SYS.** Recommending COVID-19 Vaccines to Patients: Practice and Concerns of Frontline Family Doctors. *Vaccines (Basel).* 2021;9(11):1319.
- 18-**Pal S, Shekhar R, Kottewar S, Upadhyay S, Singh M, Pathak D, et al.** COVID-19 Vaccine Hesitancy and Attitude toward Booster Doses among US Healthcare Workers. *Vaccines (Basel).* 2021;9(11):1358.
- 19-**Hall V, Foulkes S, Insalata F, Kirwan P, Saei A, Atti A, et al.** Protection against SARS-CoV-2 after Covid-19 Vaccination and Previous Infection. *N Engl J Med.* 2022;386(13):1207-20.
- 20-**Andrews N, Tessier E, Stowe J, Gower C, Kirsebom F, Simmons R, et al.** Vaccine effectiveness and duration of protection of Comirnaty, Vaxzevria and Spikevax against mild and severe COVID-19 in the UK. *medRxiv.* 2021;9(15):21263583.
- 21-**Tenforde MW, Self WH, Naioti EA, Ginde AA, Douin DJ, Olson SM, et al.** Sustained Effectiveness of Pfizer-BioNTech and Moderna Vaccines Against COVID-19 Associated Hospitalizations Among Adults - United States, March-July 2021. *MMWR Morb Mortal Wkly Rep.* 2021;70(34):1156-62.
- 22-**Mohammed HA, Alawad RA, Awad AK, Alobied AA.** Knowledge, attitude, and acceptance regarding COVID-19 vaccines in Sudan. *Front Public Health.* 2022;10:954810.
- 23-**Saied SM, Saied EM, Kabbash IA, Abdo SAE.** Vaccine hesitancy: Beliefs and barriers associated with COVID-19 vaccination among Egyptian medical students. *J Med Virol.* 2021;93(7):4280-91.
- 24-**Qunaibi E, Basheti I, Soudy M, Sultan I.** Hesitancy of Arab Healthcare Workers towards COVID-19 Vaccination: A Large-Scale Multinational Study. *Vaccines (Basel).* 2021;9(5):446.
- 25-**Detoc M, Bruel S, Frappe P, Tardy B, Botelho-Nevers E, Gagneux-Brunon A.** Intention to participate in a COVID-19 vaccine clinical trial and to get vaccinated against COVID-19 in France during the pandemic. *Vaccine.* 2020;38(45):7002-6.
- 26-**Al-Kafarna M, Matar SG, Almadhoon HW, Almaghary BK, Zaazouee MS, Elrashedy AA, et al.** Public knowledge, attitude, and acceptance toward COVID-19 vaccines in Palestine: a cross-sectional study. *BMC Public Health.* 2022;22(1):529.
- 27-**Ciardì F, Menon V, Jensen JL, Shariff MA, Pillai A, Venugopal U, et al.** Knowledge, Attitudes and Perceptions of COVID-19 Vaccination among Healthcare Workers of an Inner-City Hospital in New York. *Vaccines (Basel).* 2021;9(5):516.
- 28-**Adhikari EH, Spong CY.** COVID-19 Vaccination in Pregnant and Lactating Women. *JAMA.* 2021;325(11):1039-40.
- 29-**Tharwat S, Nassar DK, Nassar MK, Saad AM, Hamdy F.** Attitude towards COVID-19 vaccination among healthcare workers: a cross sectional study from Egypt. *BMC Health Serv Res.* 2022;22(1):1357.
- 30-**Malik AA, McFadden SM, Elharake J, Omer SB.** Determinants of COVID-19 vaccine acceptance in the US. *EclinicalMedicine.* 2020;26:100495.
- 31-**Guo Y, Kaniuka AR, Gao J, Sims OT.** An Epidemiologic Analysis of Associations between County-Level Per Capita Income, Unemployment Rate, and COVID-19 Vaccination Rates in the United States. *Int J Environ Res Public Health.* 2022;19(3):1755.
- 32-**The Lancet.** The plight of essential workers during the COVID-19 pandemic. *Lancet.*

2020;395(10237):1587.

- 33-**Pieroni V, Facchini A, Riccaboni M.** COVID-19 vaccination and unemployment risk: lessons from the Italian crisis. *Sci Rep.* 2021;11(1):18538.
- 34-**İkişik H, Sezerol MA, Taşçı Y, Maral I.** COVID-19 vaccine hesitancy and related factors among primary healthcare workers in a district of Istanbul: a cross-sectional study from Turkey. *Fam Med Community Health.* 2022;10(2):e001430.
- 35-**Khamis F, Badahdah A, Al Mahyijari N, Al Lawati F, Al Noamani J, Al Salmi I, et al.** Attitudes Towards COVID-19 Vaccine: A Survey of Health Care Workers in Oman. *J Epidemiol Glob Health.* 2022;12(1):1-6.
- 36-**Papini F, Mazzilli S, Paganini D, Rago L, Arzilli G, Pan A, et al.** Healthcare Workers Attitudes, Practices and Sources of Information for COVID-19 Vaccination: An Italian National Survey. *Int J Environ Res Public Health.* 2022;19(2):733.

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