

▪ **Basic Research**

**Electronic Survey for Knowledge, Attitude, and Practice toward COVID-19 Vaccines among Nursing Students**

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**Abstract**

**Background:** among healthcare workers, nursing students are at a higher risk of infection. **The aim** is to evaluate the electronic survey for knowledge, attitude, and practice toward covid-19 vaccines among nursing students. **Research design:** A self-administered online questionnaire was distributed to a convenience sample consisting of 444 nursing students **Setting:** The study was conducted at the governmental and private universities in Egypt. **Tools:** Three tools were used: I- nursing students' Socio-demographic Questionnaire II: Knowledge, attitude & Practice of COVID-19 Vaccine Bari (2021) III: Oxford Covid-19 Vaccine Hesitancy Scale (Freeman et al, 2020). **Results:** The group with the highest rate of vaccine acceptance (38.3%) believed that the vaccine is effective and safe, and their main source of knowledge about COVID-19 vaccines was social media. On the other hand, those who relied on social media platforms, TV programs, and news releases for information about the vaccines had a higher level of vaccine hesitancy. Interestingly, the study found that females exhibited a statistically significant higher level of COVID-19 vaccine hesitancy compared to males. **Conclusions:** Vaccination hesitation is a significant public health problem and a public health threat, especially during the epidemic we are experiencing. Therefore, it is important to understand the psychological factors involved in vaccine resistance. In this case, it would be helpful to look for ways to spread accurate vaccination information in a healthier way. **Recommendation:** Regarding nursing students, a well-structured training program should be implemented to improve their knowledge, attitudes, and practices related to infection control. This program should cover topics such as the importance of vaccinations, infection prevention measures, and effective communication skills with patients regarding vaccines. By equipping healthcare providers with the necessary skills and knowledge.

**Key words:** Knowledge & Attitude, COVID-19 Vaccines, Nursing Students

## 1. Introduction:

Effective vaccination drives are essential in curbing the rise of COVID-19 cases and easing the burden on healthcare systems. However, resistance and refusal to receive the COVID-19 vaccine can hinder prevention efforts aimed at mitigating the significant health, economic, and psychological consequences caused by this unprecedented pandemic **(Dagan, et.al, 2021)** [\[1\]](#).

Vaccination rates among young individuals have been growing at a slower rate in comparison to older age categories since the rollout of vaccine campaigns. Specifically, only 14% of 16-17-year-olds, 10% of 22-25-year-olds, and 9% of 18-21-year-olds consider themselves as "floating," which is higher than the 4% observed among all other age cohorts. **(Office for National Statistics., 2021)** [\[2\]](#)

Egypt holds a prominent position in the Middle East, Africa, and the Arab region, with an estimated population of 102 million as of July 5th, 2021. The population has been steadily growing at an average rate of 3,636 individuals per day since October 3rd, 2020. As one of the most populous nations in Africa, this raises the likelihood of COVID-19 transmission and mortality. In light of the growing awareness about the pandemic, a research study was conducted on nursing students in Egypt to assess their understanding and outlook towards COVID-19.. **(CAPMAS, 2021)** [\[3\]](#)

Particularly the COVID-19 vaccine has the psychological aspect plays a significant role in shaping an individual's inclination to receive vaccination, this is largely due to the psychological ramifications of the ongoing pandemic, which has been accompanied by an "infodemic" - an extensive spread of information, both precise and imprecise. The present COVID-19 infodemic has contributed to the dissemination of misguided beliefs and misunderstandings regarding different aspects of the disease, including vaccination, which

can impact people's attitudes and convictions about receiving the vaccination. (Murphy, et.al 2021) <sup>[4]</sup>

Nurses and doctors are playing a vital role in the global battle against COVID-19, especially in addressing concerns related to vaccination. Nonetheless, healthcare providers have the potential to play an even more important role in preparing for and managing this pandemic. As per the American Nurses Association's (ANA) 2018 policy summary, nursing leaders are critical in preventing and controlling the transmission of infectious diseases like COVID-19. (ANA 2020) <sup>[5]</sup>

## 2. Significance of the study

At present, COVID-19 vaccines have received worldwide approval, and as of March 15, 2021, more than 360 million doses of COVID-19 vaccines have been administered globally. worldwide (2021) <sup>[6]</sup>. The attainment of herd immunity is reliant on the number of vaccinated individuals within a population. Regrettably, as of May 22, 2022, almost one billion individuals in low-income countries have yet to receive any COVID-19 vaccinations. Only 57 nations have achieved vaccination rates of at least 70% of their populace, primarily comprising high-income countries. At present, the World Health Organization's primary objective is to support countries in accelerating their vaccination efforts to achieve herd immunity quickly.

In Egypt, from January 3, 2020, to May 6, 2022, 17:31 CET, 513,790 confirmed cases of COVID-19 with 24,641 deaths were reported to the WHO. A total of 82,017,392 vaccine doses had been administered as of April 30, 2022. (WHO 2022) <sup>[7]</sup>. According to researchers' point of views therefore considers it necessary to assess the knowledge and attitudes towards COVID-19 vaccines among nursing students at Egyptian universities. Because the COVID-19 pandemic has emerged as a severe global public health crisis, impacting individuals and communities worldwide. As a result, there is an urgent need to evaluate that.

Overall, it is important for healthcare professionals, including nursing students, to stay up to date on the latest information about COVID-19 vaccines and to encourage their patients and communities to make informed decisions about vaccination based on accurate information and guidance from public health authorities.

**Aim of the study** :The study aimed to evaluate the electronic survey of knowledge, attitude, and practice toward covid-19 vaccines among nursing students.

**3. The aim was achieved through the following research questions:**

- 1.What are the levels of knowledge about covid-19 vaccines among nursing students?
- 2.What are attitudes and practices about covid-19 vaccines among nursing students?

**4. Subjects and Method:**

**4.1. Study design**

A self-administered online questionnaire was distributed in January 2022, the design was performed and consisting of 444 nursing students of governmental and private universities in Egypt.

**4.2.The setting of the Study:**

This study was conducted at governmental and private nursing students' universities in Egypt. This study was accomplished at two nursing faculties. Namely the Faculties of Nursing affiliated with Egypt (faculty of nursing and nursing institute at Helwan University in Helwan City - Cairo plus the faculty of nursing MUST University on 6 October city El Giza).

**4.3.Sampling**

**Sample inclusion/exclusion criteria**

A convenience sample consisting of 444 nursing students was selected in the current study. included in the study after obtaining informed consent for participation.

Sample Equation: The sample size calculator is based on this formula.

$$\frac{\frac{z^2 \times p(1-p)}{e^2}}{\frac{1 + (z^2 \times p(1-p))}{e^2 N}}$$

Calculate the sample size using the following values.

- z – z score is directly tied to the confidence level
- e – margin of error
- n – population size
- p – 0.5

#### 4.4. Materials:

Tools of Data Collection was done through an online self-administered questionnaire: which is composed of three parts:

##### **Part I- nursing students' Socio-demographic Questionnaire:**

It was developed by the researcher after reviewing related literature. It includes items such as age, gender, Academic level, place of residence, marital status, ... etc.

##### **Part II: Knowledge, attitude & Practice of COVID-19 Vaccine Bari (2021) [\[8\]](#):**

a. This was including general information for students on COVID-19' vaccine about types, signs& symptoms, treatment, and prevention of the COVID-19 vaccine, .... etc.

questions responses were (No=0 Yes=1 or Don't Know=0) and total knowledge scoring system measuring as <50%=poor knowledge, 50:75%= average and > 75%. = good knowledge

The Mean ±SD were used to determine the Difference in Knowledge score.

b. Attitude and practice towards COVID-19 Vaccines questionnaire: Multiple questions about the perception of COVID-19. Also, to determine the beliefs and attitudes towards conventional vaccination, the participants were asked to score their perception of

efficacy, security, usefulness, and estimated knowledge of conventional vaccination in general where 0 was the lowest score and 10 was the highest score.

Additionally, 11 questions about attitudes and practice regarding the COVID-19 vaccination were included. and total Attitude and practice scoring system measuring as <50%= unsatisfied ,and >50 = satisfied

### **Part III: Oxford Covid-19 Vaccine Hesitancy Scale (Freeman et al, 2020) [\[9\]](#)**

This is a seven-item measure, derived from a study with 5,114 UK adults, quota sampled to match the population for age, gender, ethnicity, income, and region. Item specific response options, coded from 1 to 5, are used. A ‘Don’t know’ option is also provided, which is excluded from scoring. Higher scores indicate a higher level of vaccine hesitancy. The Oxford COVID-19 Vaccine Hesitancy Scale scores are associated with the Vaccine Hesitancy Scale (Shapiro et al, 2018),  $r=0.47$ ,  $p<0.001$ . The Cronbach’s alpha is 0.97. Full details of the questionnaire development can be found in the supplementary materials of the paper.

#### **4.5.Pilot study**

Prior to the actual study, an internal pilot study was carried out with a 10% sample size of the nursing students (44) to confirm that the research tools were feasible and transparent. Based on the results, minor modifications were made to improve the tools. The pilot study participants were excluded from the final study sample.

#### **Content Validity:**

Content validity was established and revised by panel of jury of at least three experts for judgment on clarity, relevance of sentences, comprehensiveness, and appropriateness of content. According to the opinion of the expertise, minor modifications were applied in the forms of rephrasing, or comprehension and changing of some questions. The face validity of the questionnaire was 95%.

**Reliability:**

To assess reliability, the study tool was tested by the pilot subjects for calculating Cronbach's Alpha which was 0.918.

**4.6.Ethical considerations**

included the following: -

- After explaining the nature and benefits of the study participants' informed consent was obtained. from all subjects.
- The aim of the study is explained to the subjects by researchers and maintains the confidentiality of the Participants
- All process in research was performed in accordance with relevant guidelines and regulations

**4.7.Procedure:****The preparatory Phase**

It included reviews of related literature and theoretical knowledge of various aspects of the study using books, articles, internet periodicals and magazines. A self-administered online questionnaire was distributed to a convenience sample consisting of 444 nursing students. The researchers obtained official permission by the answer form participants on first question in google form that is (I am agreeing to participate in this study). to conduct the study and explained its purpose to the participants, after which they obtained their consent. The data collection phase the researchers collected the data from each participant separately in an organized time and date. The researchers explained the purpose of the study before collecting the data. Then gave the tool to be filled in online, all questions were completed. Filling the tools lasted from 10-15 minutes for each subject included in the study. the study lasted for one and a half months, starting from the beginning of January 2022 until mid-February 2022 in the

settings previously mentioned. Participants were informed about their right to participate or withdraw from the study at any time during the data collection period.

#### **4.8.Data analysis**

The collected data was analyzed using appropriate statistical tests to determine their significance. For data collection and management, the researchers used SPSS (version 22), which is a computer-based tool for statistical analysis in social sciences. Descriptive statistics such as frequencies and percentages were employed to summarize the data, while Chi-square and Pearson's correlation coefficient were utilized to compare frequencies and measure the relationship between study variables. If the p-value obtained was greater than 0.05, the results were considered insignificant (NS).

#### **Result:**

Table (1) reveals that the age of the nurses' students was 18:22, with an average SD (20+6.01). Also, 57.9% of them are female and most of them 96.4% have experience with the coronavirus. but 73.2% of nursing students studied at public universities.

**Table (2):** explains that 39.9% of sample were taking the Sinovac vaccine and 27.5% the AstraZeneca vaccine, 50.2% experience no side effects after vaccination, while 88.1% experience no psychiatric side effects after vaccination but 79.7% of them see that the health system has a role to play in supporting citizens in this pandemic.

**Table (3):** illustrates that 63.1% & 47.5% respectively of them believe that awareness raising, and preventive education or foresight is a method to support the health system. While 81.5%, 70.3 and 67.3% agree that the public plays an important role in vaccination allows precautionary measures after receiving vaccination.

**Table (4):** determines that 41% are likely to receive the offered approved COVID-19 vaccine and 34.7% would like to receive the vaccine as soon as possible. While 32.9% had a positive attitude towards COVID-19 vaccines, when 45% was important to get vaccinated.



**Table (5):** shows that there are statistical significance differences between Oxford Covid-19 Vaccine Hesitancy Scale knowledge toward Covid vaccination, plus attitude & practice towards COVID-19 vaccine.

**Table (1): Distribution of socio-demographic characteristics of the Studied subjects (n=444)**

Item	No	%
<b>Age</b>		
18-21	220	49.5
22-25	185	41.7
26-28	26	6.3
28>	11	2.5
<b>Mean <math>\pm</math>SD (20.35 <math>\pm</math>6.01)</b>		
<b>Sex</b>		
<input type="checkbox"/> Male	187	42.1
<input type="checkbox"/> Female	257	57.9
<b>Marital state</b>		
Single	393	88.5
Married	47	10.6
Divorced	4	0.9
Widow	0	0.0
<b>Residence:</b>		
in Cairo	292	65.8
Out of Cairo	152	34.2
<b>Grade</b>		
1 <sup>st</sup> year	168	37.8
2 <sup>nd</sup> year	81	18.2
3 <sup>rd</sup> year	8	1.8
4 <sup>th</sup> year	167	37.6
Internship year	20	4.5
<b>Type of university</b>		
Public	325	73.2%
Private	119	26.8%
<b>Do you have a background on the Corona vaccine?</b>		
Yes	428	96.4
No	16	3.6

**Table (2): Distribution of the Studied subjects to the attitude & practice towards COVID-19 vaccine (n=444)**

<b>Item</b>	<b>No</b>	<b>%</b>
<b>The type of vaccine you received</b>		
<a href="#">AstraZeneca,</a>	122	27.5
Sinovac	177	39.9
Pfizer-BioNTech	26	5.9
Johnson & Johnson's Janssen	<b>6</b>	<b>1.4</b>
Sinopharm	86	19.4
Sinotech	8	1.8
Others	19	4.3
<b>Did you have any worries when receiving the vaccine?</b>		
Yes	148	33.3
No	188	42.3
Sometimes	108	24.3
<b>Did you have any physical side effects after receiving the first dose?</b>		
Yes	221	49.8
No	223	50.2
<b>Did you experience any psychiatric side effects after receiving the first dose?</b>		
Yes	53	11.9
<b>No</b>	391	88.1
<b>Did you have any physical side effects after receiving the second dose?</b>		
Yes	147	33.1
No	297	66.9
<b>Did you experience any psychological side effects after receiving the second dose?</b>		
Yes	36	8.1
No	408	91.9
<b>Do you see the health system as a role in supporting citizens in this pandemic?</b>		
Yes	354	79.7
No	19	4.3
Probably	71	16
<b>Do you think the vaccine is effective and safe?</b>		
Yes	170	38.3
No	47	10.6
<b>Probably</b>	227	51.1

**Table (3): Distribution of the Studied subjects according to their knowledge and attitude toward Covid vaccination (n=444)**

Item	No	%
<b>What are the methods of support from the health system?</b>		
awareness	280	63.1
Emphasis on precautionary instructions and precautions	211	47.5
Follow up through the 105 private hotlines during the pandemic	113	25.5
Providing medicines for people with corona	175	39.4
Providing places for treatment	174	39.2
Others	32	7.2
<b>Do you think that society has a big role in the obligation to receive the vaccine?</b>		
Yes	<b>362</b>	<b>81.5</b>
No	28	6.3
Sometimes	54	12.2
<b>Do you have a role in community participation to raise awareness of vaccination</b>		
Yes	312	70.3
No	132	29.7
<b>If your answer to the previous question is yes, what is the type of your participation in awareness-raising through</b>		
In University	83	18.7
In Medical and nursing convoys	73	16.4
On social media	76	17.1
In your workplace (hospital,)	78	17.6
Within the family/friends	191	43
others	116	26.1
<b>Do you adhere to the precautionary measures after receiving the vaccine?</b>		
Yes	299	67.3
No	<b>26</b>	<b>5.9</b>
Sometimes	119	26.8
<b>Would you recommend anyone to get the vaccine?</b>		
Yes	295	66.4
No	39	8.8
Probably	110	24.8
<b>Do you think that taking the vaccine is a sufficient source to confront the Coronavirus?</b>		
Yes	43	9.7
No	270	60.8
Probably	131	29.5
<b>Are you following the latest news about the new vaccines for the Coronavirus?</b>		
Yes	<b>223</b>	<b>50.2</b>
No	98	22.1
Sometimes	123	27.7
<b>Are you following the latest news about the Coronavirus?</b>		
Yes	263	59.2
No	51	11.5
Sometimes	130	29.3

**Table (4): Distribution of the Studied subjects according to their respond approved COVID-19 vaccine Oxford Covid-19 Vaccine Hesitancy Scale (n=444)**

No	Statements	No	%	Mean $\pm$ SD	
1	Would you take the (approved) COVID-19 vaccine if offered?	definitely	82	18.5	9.65 $\pm$ 4.7
		probably	182	41	
		I may or may not	98	22.1	
		Mostly not	18	4.1	
		of course, not	5	1.1	
2	If a COVID-19 vaccine is available:	I do not know	59	13.3	9.15 $\pm$ 3.48
		I would like to have it as soon as possible	154	34.7	
		I'll take it when it comes out	109	24.5	
		Not sure what to do	89	20	
		I will postpone (delay) getting it	34	7.7	
		I will refuse to have it	7	1.6	
3	I would describe my attitude towards receiving the COVID-19 vaccine as follows	I do not know	51	11.5	20.9 $\pm$ 3.5
		Too excited	42	9.5	
		very positive	144	32.4	
		neutral	146	32.9	
		very troubled	47	15.6	
		against it	4	0.9	
4	If the COVID-19 vaccine is available at your local pharmacy, I will:	I do not know	61	13.7	15 $\pm$ 2.6
		Get it as soon as possible	161	36.3	
		Get it when I have the time	111	25	
		Delay getting it	43	9.7	
		Avoid getting it for as long	36	8.1	
		You never get it	14	3.2	
5	If my family or friends are considering getting a COVID-19 vaccine file, I would:	I do not know	79	17.8	16.8 $\pm$ 1.7
		Encourage them strongly	124	27.9	
		encourage them	180	40.5	
		Don't tell them anything about it	47	10.6	
		Ask them to delay getting vaccinated	28	6.3	
		Suggest them not to receive the vaccination	12	2.7	
6	I describe myself as:	I do not know	53	11.9	3.1 $\pm$ 0.6
		Keen to get the COVID-19 vaccine	123	27.7	
		Ready to get the COVID-19 vaccine	181	40.8	
		I don't care about getting the COVID-19 vaccine	56	12.6	
		Not wanting to get the COVID-19 vaccine	23	5.2	
		Anti-vaccine for COVID-19	3	0.7	
7	Taking the COVID-19 vaccine is:	I do not know	58	13.1	2.8 $\pm$ 0.5
		very important	112	25.2	
		Important	200	45	
		Neither important nor unimportant	59	13.3	
		not important	11	2.5	
		Really unimportant	2	0.5	
		I do not know	60	13.5	

**Table (5): Correlation of the Studied subjects according to their attitude, practice & knowledge toward Oxford Covid-19 Vaccine Hesitancy Scale (n=444)**

Items	Oxford Covid-19 Vaccine Hesitancy Scale		knowledge toward Covid vaccination	
	r	P-value	r	P-value
knowledge toward Covid vaccination	0.247	0.040 * S	--	--
attitude & practice towards COVID-19 vaccine	0.395	<0.001 ** HS	0.234	0.003 * S

**figure (1):** clarifies that (44.6%) had sources of information about the coronavirus vaccine on social media. While only (5.6%) attend Seminar

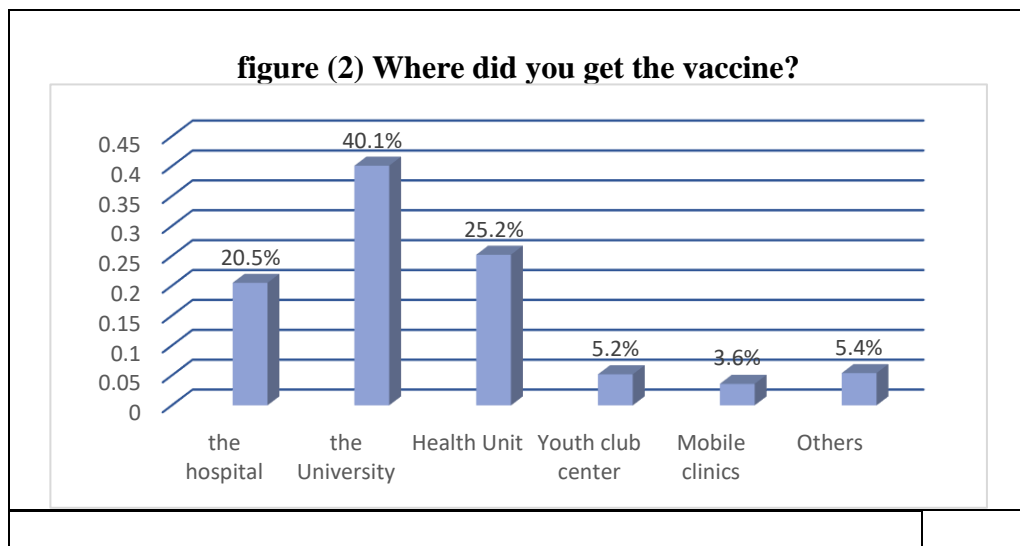
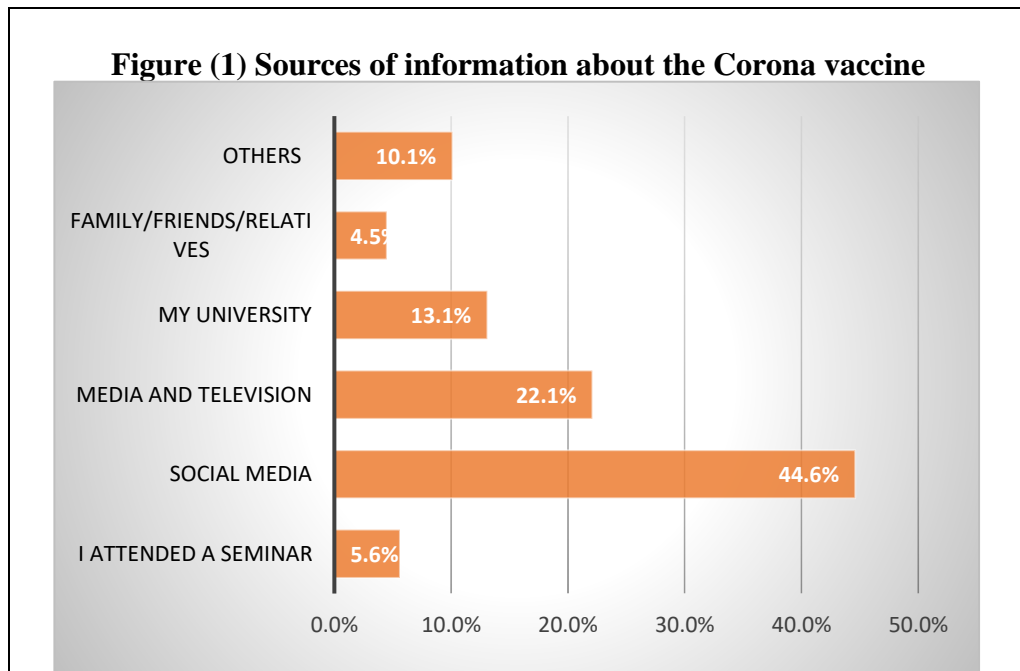
**Figure (2)**” shows that just over two-fifths (40.1%) of the nurses surveyed receive the vaccine at university and just over one-fifth (20.5 %) receives the vaccine in the hospital.

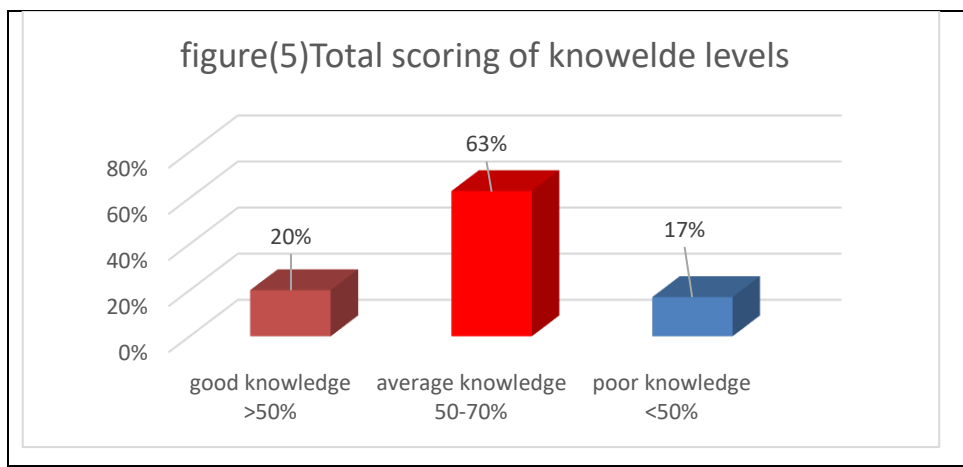
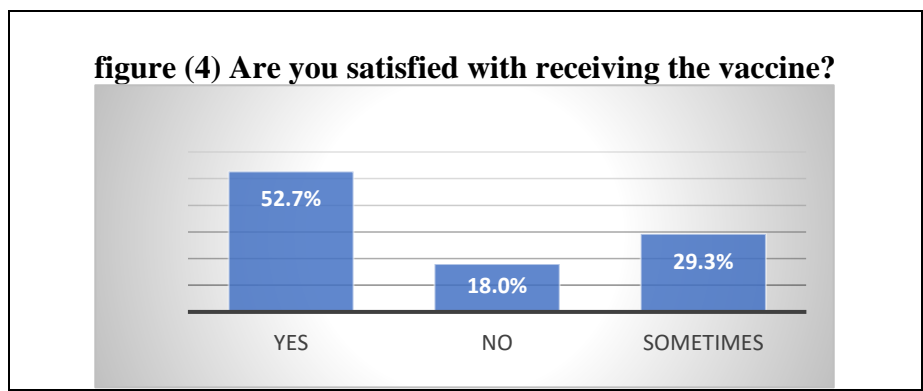
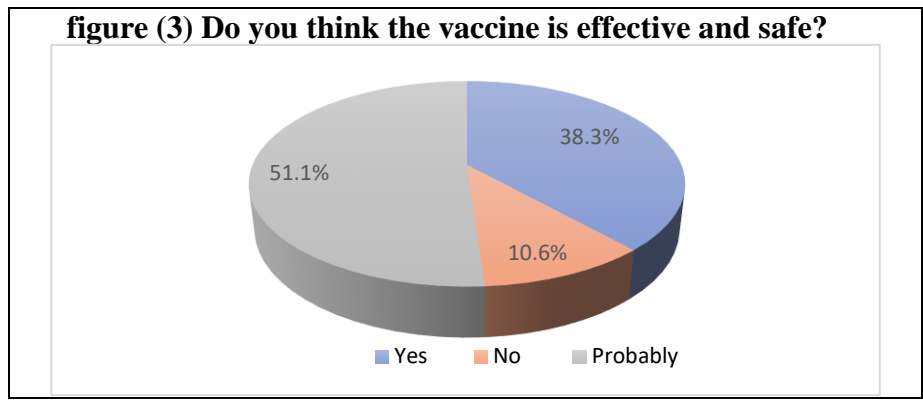
**Figure (3)**” shows that (51.1%) of the nurses surveyed are likely to believe that the vaccine is effective and safe, and more than a third of them agree that the vaccine is effective and safe.

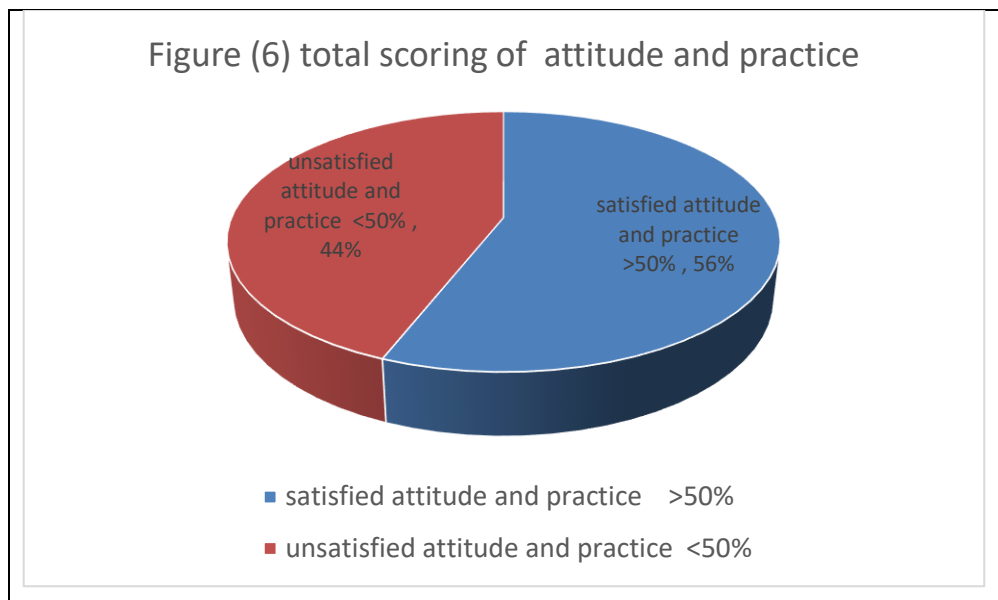
**Figure (4)**” shows that 52.7% of the nursing students surveyed are satisfied with the vaccination.

**Figure (5)**” illustrates that 63% of nurses’ students have average knowledge levels.

**Figure (6)**” illustrates that 56% of sample has satisfied attitude and practices towards COVID-19 vaccine.







## 5. Discussion

The present investigation discovered that most participating nurses were young adults, with an average age of 20 and a standard deviation of 6.01, falling within the age range of 18 to 22 years old. Also, more than half of the participants were unmarried females. It may related to the stage of studying in faculty so it is with normal characteristic of this university stage. It was further observed that most of them had previous experience with coronavirus, which is consistent with prior research conducted by (Marthoenis & Maskur, 2021) <sup>[10]</sup> conducted a cross-sectional study on Nurses' Knowledge, Attitude, and Practice Toward COVID-19 in a Referral Hospital of Indonesia, where they found that the majority of respondents were single females, with an average age of 22.64 (SD = 5.92) years old. While these results are consistent with (Amro, Rayan, Eshah, & Albashtawy, 2022) <sup>[11]</sup> who found that the majority of the participants (74.3%) were women, with a mean age of 26.0 years (SD = 4.456). the study was in Jordan to evaluate healthcare providers' knowledge, attitude, and practices regarding COVID-19



In terms of undergraduate affiliation, the current survey found that fewer than three quarters of nursing students attended state government universities and more than one quarter attended private universities. That may be related to the public universities have faculties and institutes of nursing This finding is consistent with **(Harun et al., 2022)** <sup>[12]</sup> who suggests that most of the nurses interviewed work in a public hospital.

According to the present study, over two-fifths of the study subjects obtained information related to the coronavirus vaccine from social media. The researcher's opinion that may related to the students in general spend more time on social media. This outcome is similar to **(Amro et al., 2022)** <sup>[11]</sup> who examined the sources of data regarding the COVID-19 pandemic and vaccination. and explain that the most of studied nurses get their information about COVID-19 from web page, followed by ministry of health and health authorities. These results were also, confirmed by **(Marthoenis & Maskur, 2021)** <sup>[10]</sup> who found that the important sources of information about COVID-19 were the Internet—social media 94.62%, television 44.80%, and others below 5.00%.

In the present study, regarding the timing of vaccination, the current study found that just over two-fifths of the nurses surveyed receive the vaccine at the university and just over one-fifth receive the vaccine at the hospital. because it is more easy and available to receive vaccination from universities. These results are consistent with **(Asres & Umeta, 2022)** <sup>[13]</sup> who found that most students were offered the vaccine at university. While this result contraindicated by **(Tharwat, Nassar, Nassar, Saad, & Hamdy, 2022)** <sup>[14]</sup> who reported that most study participants received the vaccine in the hospital.. These differing results could be due to various factors such as location, sample size, and population being studied. It is important to consider all available research when making decisions about vaccine distribution and public health policies.

Regarding the effectiveness of the vaccine, this study found that more than half of the nurses surveyed probably believe the vaccine is effective and safe, and more than a third agree that

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the vaccine is effective and safe. The researchers think that due to all people in world think that side effect of vaccination better than complication of virus itself that may be led to death.

This result is consistent with **(Mant, Aslemand, Prine, & Jaagumägi Holland, 2021)** [\[15\]](#) who examined A multi-methods study" and reported that the most of the studied sample trusted the corona' vaccine's effectiveness. So, it's important for people to trust in the effectiveness of vaccines in order to promote widespread vaccination and ultimately control and eliminate diseases. While this result differs from **(Wotring et al., 2021)** [\[16\]](#) which illustrated that 60% of the sample tested Fear of potential side effects of the vaccine and belief that vaccine cannot protect me from getting COVID-19. The researcher's point of view It is also important to remember that vaccines are highly effective at reducing the risk of infection, severe illness, and death. Also, it would encourage to speak with a healthcare professional for specific concerns or questions about the efficacy of vaccines.

This study investigated the attitude and practice of nurses towards COVID-19 vaccine. The findings showed that, nearly two fifths of the studied nurses take Sinovac. More than two fifths are afraid of vaccination. While, more than half not having side effect after taking vaccine. And total scoring attitude and practices towards COVID-19 vaccine was 56% of sample has satisfied attitude and practices towards COVID-19 vaccine. That may be due to searching and follow any information about that to have safe life against covid virus. This result is on the similar finding of **(Zhang et al., 2021)** [\[17\]](#) who explain that the most of the studied sample prefer to take the Sinovac vaccine more than other vaccine.

Whereover, according **(Xu et al., 2023)** [\[18\]](#) they studied "Effectiveness of inactivated COVID-19 vaccines against mild disease, pneumonia, and severe disease among persons infected with SARS-CoV-2 Omicron variant: real-world study in Jilin Province, China" and showed that more than 40% of the studied sample were vaccinated with Sinovac vaccine

(including 1, 2 or 3 doses), but 40.2% were vaccinated with Sinopharm vaccine for three doses).

The present study aimed to investigate the knowledge and attitude of participants towards COVID-19 vaccination and illustrated that less than one-third of the sample believed that awareness, precautionary measures, and instructions can support the health system, while a most of them were agreed that society has a significant role in ensuring vaccine uptake. Moreover, the total scoring of knowledge levels was 63% of nurses' students have average knowledge levels and 20% only has good knowledge levels. That may be due to the students need to increase awareness session about all data of vaccination and how deal with its side effects. These findings are agreeing with **(Adane, Ademas, & Kloos, 2022)** [\[19\]](#) who showed that less than 50% of the nurses surveyed believed that infection control is a significant means to bolster the healthcare system.. In addition this result come in accordance with **(Biswas, Mustapha, Khubchandani, & Price, 2021)** [\[20\]](#) they reported that all people were responsible for receiving COVID vaccine. Also the same was reported by **(Fares, Elmnyer, Mohamed, & Elsayed, 2021)** [\[21\]](#).

The current study found that slightly over 40% of the sample would likely take the approved COVID-19 vaccine if offered, with more than one-third expressing a desire to receive the vaccine as soon as possible. This result is on the similar line with **(Berhe et al., 2022)** [\[22\]](#) who examined the "Assessment of COVID-19 vaccination refusal among healthcare workers in Ethiopia" and found that, the vaccine is available all time. This result was also confirmed by **(Kabamba Nzaji et al., 2020)** [\[23\]](#) who explain that less than 30% of health-care workers were willing to receive the COVID-19 vaccine if available. Furthermore, this finding was supported by **(Agyekum, Afrifa-Anane, Kyei-Arthur, & Addo, 2021)** [\[24\]](#) who studied "Acceptability of COVID-19 vaccination among health care workers in Ghana" and mention that 40% of Hong Kong nurses accepted to receive the COVID-19 vaccine.

This study results revealed that regarding receiving COVID -19 vaccines, more than one a quarter encourage their family and friends to get vaccinated also, more than two fifths were willing to get vaccinated and less than half reported that it is important to get vaccinated. In addition, the current finding explains that there are statistical significance differences between Oxford Covid-19 Vaccine Hesitancy Scale knowledge toward Covid vaccination, plus attitude & practice towards COVID-19 vaccine. That may be the nursing students needed to safe themselves against corona viruses because they are involved in medical field and contact with patient's more than other specialists. this finding was confirmed by **(Li et al., 2021)** [\[25\]](#) who found that most nurses interviewed advised their families to get vaccinated.

In addition these results come in accordance **(Kaplan, Sahin, Parildar, & Adadan Guvenc, 2021)** [\[26\]](#) who studied "the willingness to accept the COVID-19 vaccine and affecting factors among healthcare professionals" and show that the importance of being vaccinated regarding Covid-19.

## **6. Conclusions**

Based on the findings of the present study the nursing students have a high level of acceptance for COVID-19 vaccination the current finding explains that there are positive statistical significance differences between Oxford Covid-19 Vaccine Hesitancy Scale knowledge toward Covid vaccination, plus attitude & practice towards COVID-19 vaccine. In addition, the total scoring of knowledge levels was three fifths of nurses' students have average knowledge levels and one fifth only have good knowledge levels. So, these students are important in healthcare, there is a need to prioritize educational efforts that will increase public awareness regarding vaccine safety and efficacy. This can improve knowledge and attitudes towards vaccination, which is crucial in preventing infectious diseases and reducing mortality rates. Nursing students, who are at a higher risk of contracting and spreading the virus, especially benefit from vaccination as a public health measure.

## 7. Recommendation

- To address the issue of infection control, it is recommended that a comprehensive training program be implemented to educate nursing faculties across Egypt. This program will aim to enhance their knowledge, attitude, and practices related to infection prevention, which is essential in ensuring that healthcare providers are well-equipped to prevent the spread of infections.
- To effectively manage the transmission of infections, it is crucial to provide well-structured training programs to all nursing faculties in Egypt. The focus of such programs should be on improving the understanding and approach of healthcare providers towards infection control measures. By doing so, we can ensure that nursing faculties throughout the country have the necessary skills and knowledge to prevent and manage infectious diseases.

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## الملخص العربي

### استبيان إلكتروني للمعرفة والسلوك والممارسة تجاه لقاحات كوفيد-19 بين طلاب التمريض في جامعات مصر

**المقدمة:** يعتبر طلاب التمريض هم من أكثر الفئات عرضة للإصابة بين العاملين في مجال الرعاية الصحية. **الهدف من الدراسة:** تقييم المعرفة والسلوك والممارسة تجاه لقاحات كوفيد-19 بين طلاب التمريض في الجامعات في مصر. **منهجية البحث:** مت استخدام تصميم توزيع استبيان إلكتروني عبر الإنترنت على عينة مائة تتكون من 444 طالب تمريض.

**مكان الدراسة:** أجريت الدراسة في بعض الجامعات الحكومية والخاصة في مصر.

**أدوات البحث:** تم استخدام ثلاث أدوات: الاداة الاولى: الاستبيان الاجتماعي والديموغرافي

الاداة الثانية: مقياس المعرفة والسلوك والممارسة تجاه اللقاح كوفيد-19

الاداة الثالثة: مقياس تردد أكسفورد تجاه لقاح كوفيد-19

**النتائج:** لوحظ أعلى معدل لقبول كبير للقاح بين أولئك الذين يعتقدون أن اللقاح فعال وآمن (38.3%) بينما كانت مصادر معرفتهم الرئيسية حول لقاحات كوفيد-19 هي وسائل التواصل الاجتماعي علاوة على ذلك ، فإن المشاركين الذين اعتمدوا على منصات التواصل الاجتماعي ، أخيرًا ، أظهرت البرامج التلفزيونية والبيانات الإخبارية كمصادر رئيسية للمعرفة حول لقاحات كوفيد-19 ، أن هناك دلالة إحصائية تم العثور على مستوى أعلى من تردد لقاح كوفيد-19 بين الإناث.

**الاستنتاجات:** يعد التردد في التطعيم مشكلة صحية عامة كبيرة وتهديدًا للصحة العامة ، خاصة أثناء الوباء الذي نمر به. لذلك ، من المهم فهم العوامل النفسية التي تدخل في مقاومة اللقاح. في هذه الحالة ، سيكون من المفيد البحث عن طرق لنشر معلومات التطعيم الدقيقة بطريقة صحية. توصية: في المستقبل ،

**التوصيات:** يوصى بتنفيذ برنامج تدريبي جيد التنظيم لاستهداف جميع كليات التمريض في مصر. يجب أن يهدف هذا البرنامج إلى تحسين معارفهم ومواقفهم وممارساتهم المتعلقة بمكافحة العدوى. من خلال القيام بذلك ، يمكننا ضمان تزويد مقدمي الرعاية الصحية بالمهارات والمعرفة اللازمة لمنع انتشار العدوى بشكل فعال.

الكلمات المفتاحية: المعرفة والسلوك ، لقاحات كوفيد-19 ، طلاب التمريض