Prevalence, Factors, and Perception against Covid-19 Vaccine Uptakes among Clinical Years of Medical Students at Al- Neelain University, Sudan, 2021.

Abstract

Aim: Thisstudy was conducted to the faculty of medicine at Al-Neelain university, Khartoum, Sudan to study the Prevalence, Factors, and Perception against Covid-19 Vaccine Uptakes among Clinical Years students.

Background: Medical students are among the frontline healthcare providers that are most likely to come into contact with COVID-19 patients. As soon as a vaccine is available, it is critical to obtain high COVID-19 immunization coverage rates in this group. They will be charged with offering vaccine recommendations and counseling vaccine-hesitant individuals as future healthcare providers.

Research methods: This research was conducted to faculty of medicine at al-Neelain University, data of 180 students in a clinical year was collected by using online Google form questionnaire that was made from similar studies and standardized survey. The verbal consent was obtainedfrom each participant.

Result:The study was conducted on 180 students, of which 50 (27.8 %) were vaccinated and 130 (72.2 %) un vaccinated, the majority of vaccinated groups are from fourth years which are 34 (32.4%), no significant differences between male and females (p-value 0.1) regarding the vaccine uptake, but shows a Correlation between Age and receiving COVID-19 vaccine (P-value = 0.04 which is significant) in which the age of 19-20 is most aged vaccinated 17% of our students' dose not trust safety of the vaccine and concern about their side effect, 7.1% does not think vaccine is effective, 6% does not know where to get vaccination and .5% relate their refusing of vaccine to a religious manner.

Conclusion: Thisstudy shows large number of unvaccinated medical student and highlights the need for an educational curriculum about the safety and effectiveness to promote uptake of the COVID-19 vaccine.

Key words:COVID-19,Vaccine,Al-Neelain University, Medical students, Pandemic

1. Introduction:

1.1. History of Pandemics

Epidemic is a disease that affects a large number of people within a community, population, or pointed region. Pandemics are an epidemic that's spread over multiple countries or continents [1].The plague outbreaks in 14th century and their effect on populations lead them to improve their knowledge and start to make a plan to survey and predict the consequences of the disease ,and it is work and discovered that some disease have a regular pattern in their distributions with specific agents and environmental factors affecting it, this allowed the constitution of a temporal series of quantitative data for the first time in the history of humanity[1].Then before 19thcentury the Cholera epidemics start to emerge in Asia as a localized disease after that the transmission be faster to Europe leading it to be a new pandemic and never stop, going to anthers continents[2].In this pandemic the scientist known as John Snow discovered that cholera is transmitted by some agent living in a water and put the trait of epidemiology, and thus this pandemics the first study which explore a causal association of pandemics[2].After that a lot of pandemics and epidemics were occur and in each one the humanity learns a new mood of transmission, environmental causes, specific agents, a new way to survey and multiple systems to be used[2].

1.2. Pandemic of COVID-19:

The corona viruses that caused the SARS and MERS pandemics discovered in 2002 and 2012 respectively belong to the group of β-corona viruses [3]. The SARS-CO-V2 genome consists of 30,000 bases and contains about 10 genes, and their function is related to the structure of the virus[3]. In December 2019, since the beginning of the Wuhan incident, the infection rate has increased. On March 1, 2020, there is 79,968 people were infected with the disease, of which 41,681 were cured and 2,873 died [4]. On January 31, 2020, the World Health Organization listed COVID19 as a Public Health Emergency of International Concern (ESPII)[4].Regarding the epidemiology ofCOVID19, travel to Hubei, China is related to introductory cases of corona virus disease, but the prevalence of transmission from individual to individual has been recorded at home and abroad[4].In December 2019, more than 90% of reported cases of corona virus disease came from Hubei Province [5]. In March 2020, Italy, the United States, Spain, France, Iran, and Germany recorded the highest prevalence of COVID19[4]. The COVID19 virus is basically spread between individuals through close contact with droplets produced by breathing, coughing and sneezing[6]. The spread of COVID19 virus through contaminated areas or pollutants may also occur after touching the mouth, eyes or nose [4]. People with symptoms have the highest risk of infecting others[5]. Now there is limited information about viral shedding in asymptomatic

individuals, but severely infected patients may experience increased levels of viral shedding [5]. The latest epidemiological model of China's corona virus disease indicates that the virus is highly contagious and continues to spread[4].In the United States, person-to-person transmission was initially limited; however, at present, this has turned into community transmission of the virus in several states. Consistently, the most recent basic reproduction number (R0) is estimated to be greater than 2.2; for every recorded case of corona virus disease in the population, there are likely to be more than 2 new cases without adequate isolation [4]. The mortality rate is estimated at 11-15%. The case fatality rate outside of China ranges from 1.2 to 5.1%, while the case fatality rate in Hubei province is 18% (95% confidence level (Cl): 11 to 18)[4]. Compared to other current epidemics, such as Ebola virus disease or SARS, the average symptomatic mortality rate from corona virus disease is about 4.2%, which is lower than that of SARS and Ebola virus disease [4]. The proposed 14-day incubation period for corona virus disease is based on the known incubation period of similar corona viruses after the first exposure. The actual incubation period is 5.2 days (95% Cl: 4.1 to 7.0); however, it can be between 2 and 14 days[6]. In approximately 22% -33% of infected people, related infections are recorded, and it may be higher in critically ill people [4].

1.3. Pathogenesis ofSARS-Cov-2:

The entry of SARSCoV2 into the host cell and the release of its genome into the target cell depend on a series of steps. Viruses use protein spikes, which are important in assessing the tropism and transmission capacity of the virus [7]. Furthermore, SARSCoV2 even targets human respiratory epithelial cells with the ACE2 receptor, indicating that the structure of RBD is similar to that of SARS-CoV-2[8]. After S1RBD binds to the ACE2 receptor, host cell surface proteases such as TMPRSS2 (transmembrane serine protease 2) act at the key cleavage site in S2[7]. This results in membrane fusion and viral infection [7]. After the invasion of the virus, the non-coated genome RNA becomes a polyprotein (PP1A and PP1AB) and then assembled in a virus-induced line membrane (DMV) and a replication / transcription complex[7].Subsequently, this double resort and synthesizes the nested sub-mineral RNA set by genomic transcription, coding structural proteins and some genomic transcription accessory proteins[9].

1.4. Vaccination against the COVID-19

In 2003 the first vaccine against S subunit in SARS-COV was done[10].Moderna Therapeutics (Cambridge, MA, USA) introduces the first vaccine which are RNA based use a S protein part to

clinical trial in February 2020[9]. This vaccine are three doses intramuscular at 28 days [11].On December 2020 the mRNA-based vaccine known as Pfizer-BioNTech COVID-19 (BNT162b2) was approved to be used in general populations consists of 2 doses (30 go, 0.3 mL each) administered intramuscularly, 3 weeks apart[12]. This vaccine preferred in aged above 16 years with known to cause a mild to moderate localized reactions in the site of injection and can cause a systemic effect after the second dose [12].in this time the Moderna also developed the mRNA-1273 vaccine and demonstrated in a third clinical trial [13]. the side effect appears in localized reaction in the site of injection and mild systemic side effect like fatigue and headache with consider that this adverse effect is more in younger age from 18-65 than in elderly above 65 years old [13].On same period at the end of 2020 the other vaccine based on DNA (adenovirus-vectored vaccine) was emerge from Oxford known as ChAdOx1 - nCoV-19 (AZD1222) by AstraZeneca which contain two dose, 28 days apart [13]. This vaccine known to be had a less adverse reaction on site of injections with approve that it's safe and effective to older people too [13].The recent vaccine made by Janssen Pharmaceuticals is Ad26.COV2. S vaccine is an adenovirus serotype 26(Ad26) vector which are single dose that known to induce a strong humeral response independent of the age group or vaccine dose with a relative minimal side effect like e fever, fatigue, headache, malign, and injection site pain[14].

2. Materials and methods

This is a descriptive cross-sectional institutional base study was conducted at Faculty of Medicine Al-Neelain university among medical students at clinical years,Al-Neelain University located in Khartoum and consists of more than 20 faculties and a number of centers. Faculty of Medicine was added to the university in the nineties and the first batch was in 1999 and graduated in 2004. The faculty curriculum is at international standard.

2.1. Data Collection

Questionnaires were distributed to 180 participants (63 male and 117 female) from fourth and fifth year after obtaining their consent to participate. It was ensured that the questionnaires were filled out correctly, Pre testing was done to ensure quality survey instruments and fieldwork procedures were conducted.

2.2. Data Management

Data was entered, cleaned, and analyzed using SPSS version 25.0. Descriptive statistics in term of frequency tables with percentages and graphs. Chi square test and t- test statistical tests applied to calculate P value.

3. Results

The study was conducted on 180 students, of which50 (27.8%) were vaccinatedand 130 (72.2%) unvaccinated, the majority of vaccinated groups are from fourth years which are 34 (32.4%), and the figures and tables below demonstrate the data and important findings. First the vaccine response, age and gender distributions.

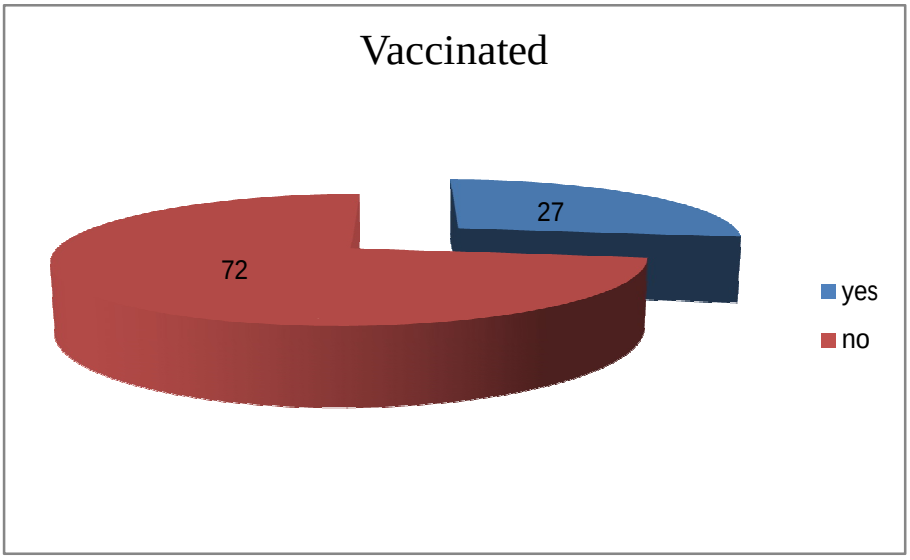

Figure 1:

Table 1: Responses of participant towered covid-19 vaccine

	Are you Vaccinated to covid-19		Total
	Yes	No	

Gender	female	Count	30	86	116
		% Within Gender	25.9%	74.1%	100.0%
	male	Count	20	44	64
		% Within Gender	31.3%	68.8%	100.0%
Total		Count	50	130	180
		% Within Gender	27.8%	72.2%	100.0%
P value .4					

Table 2: Responses among covid-19 vaccine those are vaccinated and not vaccinated in relation with clinical level

			Are you Vaccinated to covid19		
			yes	no	Total
Clinical year	fifth	Count	16	59	75
		% Within Clinical year	21.3%	78.7%	100.0%
	fourth	Count	34	71	105
		% Within Clinical year	32.4%	67.6%	100.0%
Total		Count	50	130	180
		% Within Clinical year	27.8%	72.2%	100.0%
P value .1					

Table (2) represented the vaccinated groups and not vaccinated groups in relations with their academic level, shown that most of the both academic levels are not vaccinated from covid-19 and the lager not vaccinated groups appear to be in fifth clinical year compare with fourth year the distributions among medical level showed no significant change in medical years (p value 0.1)

Table 3: represent factors that affect the covid-19 vaccine among participants in this study

Reason for not accepting the Covid19 vaccine					
	Frequency	Percent	Valid Percent	Cumulative Percent	P value
I don't think vaccine is safe	31	17.0	17.2	17.2	

	I don't think vaccine is effective	13	7.1	7.2	24.4	.004
	trust my immunity	10	5.5	5.6	30.0	
	I don't know where to get good/reliable information	7	3.8	3.9	33.9	
	fear of needles	1	.5	.6	34.4	
	religious reasons	1	.5	.6	35.0	
	don't know where to get vaccination	11	6.0	6.1	41.1	
	I heard it's caused a bad side effect	31	17.0	17.2	58.3	
	I accepted already	75	41.2	41.7	100.0	
	Total	180	98.9	100.0		
Missing	System	2	1.1			
Total		182	100.0			

Table (3) represented the factors that contribute to affect the uptake of covid-19 vaccine in medical students in clinical years which demonstrate that most of them are afraid from the vaccine side effect and not sure about its safety.

4. Discussion:

Medical students are at increased risk to developed the covid-19 infections and this can lead to a significant collapse in health care system so their attitude towered covid-19 vaccine play a major's role in this pandemic [13]. A study done in Italy showed that more than 98% of their medical students have a positive attitude concerning the covid-19 vaccine [14].In another hand similar study done among American medical student result on a 60.6 % acceptance rate regarding the covid-19 vaccine [13].In our study the uptake rate of vaccination is just a 27.8% from the total population we covered. A study that done in Slovenian medical students showed male (66% vs. 55%) students are more complaint to take the vaccine [15]. in our study result appears that there isno significant differences between male and females (p value 0.1) regarding the vaccine uptake ,but shows a Correlation between Age and receiving COVID-19 vaccine (P value = 0.04 which is significant) in which the age of 19-20 is most aged that get the vaccine .the study that we mentioned which done in medical students in Slovakia listed that 93.6% of their student trust the vaccine information[13].recent study done on Egyptian medical students said that

The majority of students (96.8%) were concerned about the vaccine's side effects and ineffectiveness (93.2 percent) ,Deficient data regarding the vaccine's adverse effects (possible 74.17 percent and unknown 56.31 percent) and insufficient information about the vaccine itself were the most confirmed barriers to COVID19 vaccination (72.76 percent)[16]. in compare toour study,we foundthat a17% of our students' dose not trust safety of the vaccine and concern about their side effect, 7.1% does not think vaccine is effective, 6% does not know where to get vaccination and .5% relate their refusing of vaccine to a religious manner. A study done to show the hesitate towered the covid-19 vaccine among medical student and found that nearly all participants were positive about vaccines and agreed that they would most likely be exposed to COVID-19; nevertheless, only 53% said they would participate in a COVID-19 vaccine trial, and 23% said they would refuse to take a COVID-19 vaccine as soon as it was approved by the FDA [17].Here in our study a 44.4% of students who are unvaccinated are ready to get the vaccine.And 81.1 % of our total population agreed with that they need this vaccine to protect their self and communities from covid-19 disease. Also, the result shows that 82.2% of them admitted that themandatory of spreading the vaccine by health system to all health care providers, with 91.1% of study population who agree with the necessary of vaccinations to be spread overall the communities.

Conclusion:

This study shows large number of unvaccinated medical student and highlights the need for an educational curriculum about the safety and effectiveness to promote uptake of the COVID-19 vaccine.

Competing Interests:

Authors have declared that they have no known competing financial interests OR non-financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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