Evaluation of SARS-CoV-2 vaccination rate among healthcare workers in a tertiary hospital in Mogadishu Somalia: A cross-sectional study

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Abstract

Background

The percentage of healthcare workers that are vaccinated against SARS-CoV-2 in Somalia remains unknown. The main purpose of our study is to determine the SARS-CoV-2 vaccination rate among healthcare workers in a tertiary hospital in Mogadishu, Somalia.

Methods

The design of the study is cross-sectional which was undertaken to assess the vaccination rate of healthcare workers in Mogadishu Somali Turkish Training and Research Hospital from September 1 to September 20, 2021. A total number of 210 healthcare workers have participated in this study. The data were collected using a questionnaire.

Results

Out of 210 healthcare workers that have enrolled in the study 56.2% (n=118) were males. The mean age of the participants was 28.23 with SD $\pm$ 2.9. The most abundant age group in our study was 18-27 years with 53.8% (n=113). According to the participant's profession, the doctors were the commonest participant with 48.6% (n=102). The SARS-CoV-2 vaccination level of the healthcare workers in Mogadishu Somali Turkish Training and Research Hospital was found to be 20% (n=42). 26.2% of the males that participated in this study were vaccinated against SARS-CoV-2 while only 12% of females were vaccinated. The study found that there is a significant correlation between SARS-CoV-2 vaccination and gender with *p value* < .05. The study also revealed that there is a negative correlation between age and being vaccination against Covid-19 disease with *p value* < .01. 30% (n=31) of the doctors, 5.6% (n=4) of nurses, 14.2% (n=14) of radiology technicians, 30.7% (n=4) of anesthesia technicians, and 10% (n=1) of laboratory stuffs were vaccinated against SARS-CoV-2. The reasons for SARS-CoV-2 vaccine hesitancy were fear towards the vaccine complications 58% (n=97), followed by believed that vaccine will not be beneficial, lack of opportunity, no reason, and avoiding for religious or social reasons in 23% (n=39), 8.3% (n=14), 9% (n=15), 1.7% (n=3), respectively.

Conclusion

We found that only 20% of the healthcare workers in a tertiary hospital in Somalia were vaccinated against SARS-CoV-2 infection. This is an emergency public health situation as it will put the healthcare workers and the patients at risk for developing Covid 19 disease.

Background

SARS-CoV-2 infection not only became a major global health burden when it's first discovered in late 2019, but it also became an economic and social burden throughout the world ⁽¹⁾. In many countries, Covid 19 vaccine was approved for the general population at the end of 2020 and early 2021^(2, 3). SARS-CoV-2 vaccines were evaluated through many clinical trials and demonstrated to have a high level of protection against the Covid-19 disease ⁽¹⁾.

In accordance with their profession, healthcare workers (HCW) are one of the most prone population groups to contract Covid-19 disease ⁽⁴⁾. Due to that reason, HCW was identified as one of the priority groups to receive SARS-Cov-2 vaccine worldwide ⁽⁵⁾. Despite these efforts from the governments and institutions to vaccinate HCW, the acceptance rate of vaccination among HCW is low. For instance, a poll that was arranged by the Kaiser family foundation in December 2020 found that 29% of the HCWs were hesitant to get COVID-19 vaccines where 27% of the individuals in the general population did not want to take the vaccine ^(3, 6).

Biswas et al. found that more than 75,000 healthcare professionals around the world estimated that more than a fifth of the healthcare workers globally was not willing or hesitant to take SARS-Cov-2 vaccinations in 2021 ^(3, 7).

Meanwhile, the Somali ministry of health reported its first confirmed SARS-Cov-2 infection in mid-March 2020. As of this date, the country reported a total of 22,369 cases with 1,238 death cases ⁽⁸⁾.

In early March 2021, the first doses of SARS-CoV-2 vaccine arrived in Somalia through COVAX facility. Therefore, the Somali government rushed to vaccinate frontline HCW and the people with the highest risk ⁽⁹⁾. The government has distributed at least 668,104 SARS-CoV-2 vaccine shots at the time of writing this article ⁽¹⁰⁾.

To the extent of our knowledge, the percentage of HCW that is vaccinated against SARS-CoV-2 infection in Somalia remains unknown. The main purpose of our study is to determine SARS-CoV-2 vaccination rate among healthcare workers in a tertiary hospital in Mogadishu, Somalia. This study also intends to investigate the reasons HCW in Somalia are hesitant to take SARS-CoV-2 vaccine.

Methods

The main goal of our study is to determine the SARS-CoV-2 vaccination rate among healthcare workers in a tertiary hospital in Mogadishu, Somalia.

Study Population, Design, and Data Collection:

This study is a single center-based study done in Mogadishu Somali Turkish Training and Research Hospital. The hospital is a tertiary hospital that has all the health departments and serves at least one thousand patients per day. There are more than 500 healthcare workers who are actively working in the

hospital. A total number of 210 healthcare workers from Mogadishu Somali Turkish Training and Research Hospital have agreed and gave their consent to participate in the study.

The SARS-CoV-2 vaccines that Mogadishu Somali Turkish Training and Research Hospital healthcare workers received were Oxford AstraZeneca vaccine and Sinopharm COVID-19 vaccine.

The design of the study is a cross-sectional study that was undertaken to assess the vaccination rate of healthcare workers in Mogadishu Somali Turkish Training and Research Hospital from September 1 to September 20, 2021.

We collected the data using a questionnaire which was prepared in a google form document. A link to the google form questionnaire document was sent to every healthcare worker who works in Mogadishu Somali Turkish Training and Research Hospital through WhatsApp application. Some healthcare workers were not reached through WhatsApp application; thus, a written form of the same questionnaire was collected through a face-to-face interview by one of our authors to ensure the accuracy of the data.

The questionnaire was composed of 3 parts of questions. The first part of the questionnaire addressed the demographic profiles of the participants. The demographics that were obtained from this questionnaire included age, sex, and the profession of the participants. If the participant defines their profession as a doctor, there was a following question that asks the participant his or her department. The second part of the questionnaire composed of questions about the level of SARS-CoV-2 vaccination of the participant. It also encompasses questions for the reasons for not getting the SARS-CoV-2 vaccine if the respondent is not vaccinated. The last part of the questionnaire consisted of questions that only the vaccinated participants could answer. It contains questions that addressed if the vaccinated participant had encountered any complications after they received SARS-CoV-2 vaccine regardless of the type of the vaccine they have taken.

Exclusion Criteria:

All non-healthcare workers of Mogadishu Somali Turkish Training and Research Hospital were excluded from the study. Also, healthcare workers who refused to participate were excluded from this study.

Statistical analysis

The data that was collected through google form and the written questionnaires were then transferred to Microsoft Excel sheet and then imported to Statistical Package for Social Sciences (SPSS) software version 26. The data was finally analyzed using Statistical Package for Social Sciences (SPSS) software version 26. Descriptive statistics, compare means were mainly used in the study. Pearson's correlation was also used in this study. The analyzed data was presented as frequencies and percentages.

Results

Demographics:

Out of 210 healthcare workers that have enrolled in the study, 56.2% (n=118) were males and 43.8 (n=92) were females. The mean age of the participants was 28.23 with SD $\pm$ 2.9 (Table1). The age of the participants was further divided into age groups. The most abundant age group in our study was 18-27 years with 53.8% (n=113). The second most common age group in the study was 28-35 years with 42.9% (n=90), followed by 36-50 years with 3.3% (n=7) (Table 2).

According to the participant's profession, the doctors were the commonest participant with 48.6% (n=102). The second most common participant were nurses with 33.8% (n=71), followed by radiology technicians, anesthesia technicians, and laboratory staffs with 6.7% (n=14), 6.2%(n=13), 4.8% (n=10), respectively (Table 2).

SARS-CoV-2 vaccination level of the participants:

The SARS-CoV-2 vaccination level of the healthcare workers in Mogadishu Somali Turkish Training and Research Hospital was found to be 20% (n=42). The remaining 80% of the participants (n=168) were not vaccinated against SARS-CoV-2. 26.2% of the males that were participated in this study were vaccinated against SARS-CoV-2 whereas 12% of the females were vaccinated against SARS-CoV-2 (Table 2).

This study found that there is a significant correlation between SARS-CoV-2 vaccination and gender with *p value* < .05. Also, the study revealed that there is a negative correlation between age and being vaccination against Covid-19 disease with *p value* < .01 (Table 5).

According to participant's profession, 30% (n=31) of the doctors were vaccinated against SARS-CoV-2. This study also found that only 5.6% (n=4) of nurses were vaccinated against SARS-CoV-2. In addition, 14.2% (n=14) of radiology technicians were vaccinated against SARS-CoV-2, 30.7% (n=4) of anesthesia technicians, and 10% (n=1) of laboratory staffs were vaccinated against SARS-CoV-2. This study found no correlation between SARS-CoV-2 vaccination and the profession of the participants with *p value* = .18 (Table 2).

Reasons for not getting SARS-CoV-2 vaccination among the participants:

Out of 210 participants, 80% (n=168) were not vaccinated against SARS-CoV-2. Of the 168 participants who were not vaccinated against SARS-CoV-2, the most common reason for not getting the SARS-CoV-2 vaccine was fear of the vaccine complications with 58% (n=97). 23% (n=39) of the participants believed that the vaccine will not be beneficial to them. 8.3% (n=14) said that they did not get an opportunity to get vaccinated. In addition, another 9% (n=15) responded that they did not get the vaccine for no reason, while the remaining 1.7% (n=3) responded to have avoided the SARS-CoV-2 vaccine for religious or social reasons (Table 3).

Common side effects of SARS-CoV-2 vaccinations among the participants:

Out of the 42 participants that have received SARS-CoV-2 vaccination, 42.8% (n=18) have reported side effects due to the vaccine regardless of the type of SARS-CoV-2 vaccine which they have received. Fever was the most frequented side effect that the participants reported with 78% (n=14). Body ache was the second most reported side effect due to SARS-CoV-2 vaccination with 72.2% (n=13), followed by pain at the site of injection with 44.4% (n=8). Our participants did not report any form of thrombosis or other serious condition as a complication due to SARS-CoV-2 (Table 4).

Discussion

The novel coronavirus infection 2019 (COVID-19) has been ongoing and infecting numerous people affecting their daily life in the process ^(11, 12). Authorities around the world have made multiple public health measures to halt the ongoing virus such as physical distancing, wearing masks, and a total lockdown which brought the world economy on a brink of collapse ⁽¹¹⁾.

Hence, this situation sparked the most extensive vaccine hunt in the history of medicine ^(13, 14). Many studies about SARS-CoV-2 vaccine have been done around the globe to know their safety and side effects on the population. A study done in Canada in 2021 by Vilches et al. suggested that SARS-CoV-2 vaccination could potentially decrease the number of people that could be infected by the virus and thus decreases the morbidity and mortality of the SARS-CoV-2 infection in the population ⁽¹¹⁾.

Some regions around the world have high acceptability rate of SARS-CoV-2 vaccination than other regions. For instance, in Vietnam, a study done by Huynh et al. in 2021 about the willingness of healthcare workers to get SARS-CoV-2 concluded that 76% of HCW were willing to get vaccinated for SARS-CoV-2 infection ⁽¹⁵⁾. Another example is a cross-sectional study done in France by Gagneux-Brunon et al. in 2021 which assessed the intentions of HCW to get vaccinated against SARS-CoV-2 infection found that the intention to get the vaccine be 75% ⁽¹⁶⁾.

We conduct our study to get a clue about the level of vaccination among frontline health workers in Somalia. In the presenting study, we found that the level of SARS-CoV-2 vaccination rate among healthcare workers in Mogadishu Somali Turkish Training and Research Hospital to be 20%. We found that 80% of healthcare workers were not vaccinated against SARS-CoV-2 infection.

Furthermore, our study suggested that sex is a significant positive predictor to get SARS-CoV-2 vaccine as males were more vaccinated than females. This fact can be debatable since males were the common gender among the participants. This positive prediction between gender and vaccine was also backed by a metanalysis done by Biswas et al. in 2021 who also found that the male gender was more likely to accept SARS-CoV-2 vaccination than females ⁽³⁾.

Our study also found that 30% of the doctors who are working in Mogadishu Somali Turkish Training and Research Hospital were vaccinated. The SARS-CoV-2 vaccination level was much lower in nurses with only 5.6% of the nurses being vaccinated against SARS-CoV-2 infection. This reality puts the nurses in great danger as they are the ones who contact the patients more often. Our finding also indicates that younger participants tend to be more likely vaccinated against SARS-CoV-2 than the older participants.

We did not find any association between the participant's profession and being vaccinated against SARS-CoV-2.

Since most of our participants were not vaccinated against SARS-CoV-2 infection. The most common reason for not getting vaccinated among our participants was fear of the complications of the SARS-CoV-2 vaccines. Also, a handful of participants believed that the vaccine will not help them or protect them from SARS-CoV-2 infection. That number was as high as 23%. This was also a finding in a review metanalysis by Biswas et al. in 2021 who also found that the most common reasons for HCW hesitancy to be vaccinated against SARS-CoV-2 be vaccine safety, efficacy, and side effects ⁽³⁾.

A cross-sectional study done by online by Mohamed al et al. in 2020 about SARS-CoV-2 vaccination acceptance in population living in Mogadishu found that 63.2% of the participants refused to take the vaccination if available ⁽¹⁷⁾. Another cross-sectional study done through online by Ahmed et al. found that 76.8% of the respondents were willing to receive vaccine ⁽¹⁸⁾.

In the presented study, we also asked our participants who were vaccinated against SARS-CoV-2 infection if they had experienced any complications after they get vaccinated regardless of the type of vaccines. Most of our participants said that they have experienced fever after they get the SARS-CoV-2 vaccination followed by body ache and pain at the site of injection. This cannot be used as future evidence for side effects of individual vaccine could have, so another wide range study is needed to determine the side effects of SARS-CoV-2 vaccination.

There are some limitations of our study. Those include a small sample size with only a single hospital healthcare workers. Nevertheless, we believe that our study can be representative of the SARS-CoV-2 vaccination level of the healthcare workers in Mogadishu as this is a tertiary hospital and the biggest care provider hospital in Mogadishu, Somalia.

Conclusion

In the presenting study, we found that only 20% of the healthcare workers in a tertiary hospital in Somalia were vaccinated against SARS-CoV-2 infection. Most of the respondents were hesitant to be vaccinated despite the availability of the vaccine. This is an emergency public health situation as it will put the healthcare workers and the patients at risk for developing Covid 19 disease. The policymakers must implement a new and effective strategy to raise the awareness of healthcare workers towards SARS-CoV-2 vaccination.

Abbreviations

COVID-19= coronavirus disease 19

HCW= healthcare workers

n= sample size

SARS-CoV-2= severe acute respiratory syndrome corona virus 2

SPSS: Statistical Package for Social Sciences.

Declarations

We perform our study in accordance to the declaration of Helsinki.

Competing of interest:

The authors declare that they have no competing of interest.

Funding source:

The authors declare they have no funding source for this research.

Acknowledgment:

We thank to all participants who gave their consent to be involved in this study.

Data Availability:

The data is available from the corresponding author and can be accessed upon reasonable requested.

Ethical consideration:

Informed consent was obtained from every healthcare worker that participated in this study. This study does not reveal any personal data and the privacy of the participants was well protected. This study had been evaluated and approved by Mogadishu Somali Turkish Training and Research Hospital ethical committee.

Authors contribution:

Jeele, MOO, brought the concept of the study, collected the questionnaires, performed data analysis, and prepared the manuscript.

Bashir, AM, participated the data collection.

Jimale, LH, participated the manuscript preparation.

Adani, AA participated the manuscript preparation.

All authors read and approved the final manuscript before submitting.

Consent for publication

Not Applicable

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Tables

Table:1. Age distribution

N	Valid	210
	Missing	0
Mean		28.23
Mode		26
Std. Deviation		2.920

Table:2. Descriptive analysis results of vaccination level according to demographic variables					
Age	Vaccinated	Non-vaccinated	% Of Vaccinated	Total HCW	<i>P Value</i>
18-27 years	13	100	11.5	113	<0.01**
28-35 years	26	64	29	90	
36-50 years	3	4	43	7	
Sex					
Male	31	87	26.2	118	<0.01**
Female	11	81	12	92	
Profession					
Doctor	31	71	30	102	<0.182
Nurse	4	67	5.6	71	
Radiology technician	2	12	14.2	14	
Anesthesia technician	4	9	30.7	13	
Laboratory stuff	1	9	10	10	
Total	42	168	20	210	
** Indicates correlation between variables					

Table:3. Reasons of not getting SARS-CoV-2 vaccine for unvaccinated participants

Age	I did not get the opportunity		I do not think it will be beneficial to me		I am afraid of its complications		I do not want to take vaccine due to religious or social reasons		No reason	
	n ()	%	n ()	%	n ()	%	n ()	%	n ()	%
18-27 years	(9)	9	(20)	20	(61)	61	(3)	3	(7)	7
28-35 years	(5)	7.8	(18)	28	(33)	51.52	(0)	0	(8)	12.5
36-50 years	(0)	0	(1)	25	(3)	75	(0)	0	(0)	0
Sex										
Male	(7)	8	(22)	25.2	(46)	53	(1)	1.1	(11)	12.6
Female	(7)	8.6	(17)	21	(51)	63	(2)	2.4	(4)	5
Profession										
Doctor	(8)	11	(21)	30	(34)	48	(1)	1	(7)	10
Nurse	(3)	4.4	(13)	19.4	(46)	69	(0)	0	(5)	7.4
Radiology technician	(1)	8.3	(2)	16.7	(5)	41.6	(1)	8.3	(3)	25
Anesthesia technician	(1)	11.1	(1)	11.1	(6)	66.6	(1)	11.1	(0)	0
Laboratory stuff	(1)	11.1	(2)	22.2	(6)	66.6	(0)	0	(0)	0
Total	(14)	8.3	(39)	23	(97)	58	(3)	1.7	(15)	9

N= sample size

Table:4. This table summarizes the complications that vaccinated participants experienced regardless the type of vaccine

Variable	n Sample size	%
Fever	14	78
Body ache	13	72.2
Pain at the site of injection	8	44.4

Table:5. Correlations between SARS-CoV-2 vaccine and age, gender, and profession.

Variables	SARS-CoV-2 vaccine		
	Pearson correlation	Significant 2 tailed	N (sample size)
Age	-0.185**	0.007**	210
Gender	0.178**	0.010	210
Profession	0.092	0.182	210

** indicates correlation between variables