

Type of article: Original Research Article

Title: Covid-19 Vaccine Uptake and Associated Factors Among Healthcare Workers In Lower Juba Region Of Jubaland State In Somalia.

Abstract

Background: Somalia's health systems were weakened by decades of conflicts, and this was made worse by the coronavirus pandemic that hit the nation like the rest of the world. Despite the existence of different types of COVID-19 vaccines, there has been a reluctance to take the vaccine by the general population and ironically by healthcare workers.

Objective: The purpose of this study was to evaluate the uptake of the COVID-19 vaccine in the Lower Juba Region of the Jubaland State in Somalia among healthcare providers

Method: The research study used a quantitative descriptive design to describe the levels of COVID-19 vaccine uptake among healthcare workers. The study recruited 191 study respondents. Stratified and simple random sampling methods were used. All the significance tests were conducted with two tails, and the threshold for statistical significance was set at P less than 0.05

Results: From this study, 46.6% of the study respondents had been vaccinated with the Covid-19 vaccine. Being male (OR = 1.4, 95% CI = 0.7878 to 2.473). Being a healthcare worker aged between 21 and 50 (OR = 2.6, 95% CI = 0.8027 to 8.5649) and having a postgraduate degree (OR = 3.7, 95% CI = 0.9228 to 15.3868), increased the odds of Covid-19 uptake.

Conclusion: From this research, close to half of the study respondents had been vaccinated with COVID-19 vaccines. In addition, Being male healthcare workers, healthcare workers aged between 21 and 50 having healthcare professionals with postgraduate degrees increased the odds of COVID-19 uptake.

Keywords: Covid-19, Vaccine, Vaccine Uptake, Vaccination, Somalia, HCWs

Comment [Ma1]: the study's statistical significance threshold is set at $P < 0.05$, which is standard, but the p-values mentioned are higher than this threshold, which might affect the interpretation of the findings

1.0 INTRODUCTION

In late winter 2019-2020, unidentified pneumonia cases emerged in Hubei, China. COVID-19 was later described as the causal culprit[1]. In the weeks and months that followed, the virus became a global pandemic. It was initially considered as pneumonia of unknown cause. It spread faster, within China and the rest of the world. On the 30th of January 2020, the WHO proclaimed an international concern in the public health emergency, and then on the 11th of March 2020, they declared it a pandemic[2]. As of 10th March 2022, there were more than 451 million cases in the world with more than 6 million deaths worldwide. The Somali government's first case was announced on March 16th, 2020 in Mogadishu and the first death was reported on April 8 same year. As of 10 March 2022, the country had recorded 26,400 cases and 1,348 deaths. There is a weak infrastructure in Somalia's healthcare; The Health Security Global Index puts Somalia at 194th out of 195 countries[3].

The effects of the virus were enormous ranging from loss of lives to restriction of movements. As the virus mutated, even the young were not spared the severe disease requiring hospitalization and ICU care. No cure was found but several supportive treatments were tried with some success[4]. The development of the vaccine was also hastened by COVAX leading to several different vaccine types being approved for use globally(Ibrahim et al., 2021). Vaccines provide the best public health protection, but only if they are widely used. In the present COVID-19 pandemic, significant vaccination coverage is required to provide indirect public protection, restore society to normalcy, and reopen the world's economy(Al Mutair et al., 2020).The first coronavirus vaccinations arrived in Somalia from China on April 11, 2021. Healthcare workers were given priority in the mass vaccination exercise. If health professionals are not safeguarded, healthcare systems will likely be overburdened, and the most vulnerable children and women in the states will continue to be denied access to essential services, jeopardizing decades of growth and causing the children from poor to fall farther behind[5].As of 11th March 2022, almost a year later, 1.84 million doses were administered with 938,000 being fully vaccinated. This meant that 5.9% of the targeted people were vaccinated, far lower than the global average of 56.16%[6]. The vaccination exercise targeted at-risk groups and other frontline staff like healthcare workers, the elderly (above 65), those with chronic illnesses, teachers, and the security forces[7].

The reluctance to uptake is much more widespread in the African continent, which already suffers from inadequate healthcare infrastructure and a shortage of medical professionals. The World Health Organization (WHO) announced in November 2021 that only 27% of health workers in Africa had received the full COVID-19 vaccination[8]. This means that the majority of the workforce that is working on the frontlines of the pandemic is not protected. Based on an analysis of the data that was submitted by 25 nations, the findings indicate that only 1.3 million health workers as of March 2021 can be classified as fully vaccinated [9]. Countries that have reached 90% or more were only six, while those with less than 40% of their health workers fully vaccinated were nine countries. In stark contrast, the World Health Organization (WHO) conducted a global assessment of 22 nations, the majority of which have high incomes, and found that more than 80 percent of their healthcare staff are fully vaccinated [10].

Hospitals have tried several methods to raise workervaccination rates. Some hospitals employ circulating carts to deliver immunization to staff briefing or nursing stations[11]. Vaccine decliners may be required to sign waivers admitting the danger they are taking for their patients and themselves or to wear protective suits during this season. All of these methods are intended to make vaccination as easy as feasible, and avoidance as difficult[11]. Unfortunately, even though these measures to attain voluntary compliance have been shown to enhance vaccine uptake slightly, vaccination rates remain below 50%(Adedeji-Adenola et al., 2022). Despite the demonstration by research that vaccines are safe, there is growing skepticism about immunization. Vaccine hesitancy has led to a decrease in vaccine uptake as well as an increased prevalence of diseases preventable by vaccines, both of which are concerning. Hesitancy in vaccination is a significant impediment to the development of herd immunity. Given all of this, the study's purpose was to examine the COVID-19 Vaccine among healthcare workers in the lower Juba region of Jubaland state in Somalia.

Comment [Ma2]: Since the title suggests a focus on vaccine uptake and associated factors, the introduction could briefly mention some of the known challenges or risks associated with vaccine rollout in Somalia, such as logistical issues, political instability, or cultural factors, to provide a more comprehensive backdrop for the study.

Comment [Ma3]:

2. METHODOLOGY

2.1 Research Design

A descriptive design research approach was selected for this study's investigation methodology.

Comment [Ma4]: The phrase "investigation methodology" is somewhat redundant. You might simplify the statement to something like: "A descriptive research design was selected for this study."

2.2 Study Area

The Lower Juba region of the Jubaland state located in the Somalia region served as the location of this study's data collection. In southern Somalia, the administrative region is known as Lower Juba. Lower Juba is bordered to the north by Middle Juba and Gedo, to the west by Kenya, to the northeast by Middle Juba, and to the east by the Indian Ocean. There are four districts in this region, and their names are Badhaadhe, Afmadow, Jamaame, and Kismaayo.

2.3 Study Population

The population targeted was 359 healthcare workers. There are 21 health facilities in the lower Juba region of Jubaland state in Somalia with a total of 359 healthcare workers.

2.4 Sample Size Determination

The number of sample respondents was calculated using Slovin's formula for the known population. As a result, 189 study respondents were recruited for this study.

Comment [Ma5]: Elaborate detail sample size calculation process with margin of error taken

2.5 Sampling Technique

Stratified and proportionate sampling procedures were used to allocate the respective quota for each district out of the 191 sample sizes. This depended on the proportion of healthcare workers in the 21 health facilities. This sample will only consist of doctors, nurses, midwives, laboratory technicians, pharmacy technicians, and their assistants.

Comment [Ma6]: it could benefit from additional detail. For instance, explaining how the strata were defined (e.g., by district, healthcare facility type, or job role)

2.6 Data Collection Method and Instruments

For this study, primary data was utilized, and it was gathered utilizing an online close-ended and structured questionnaire. The WHO BeSD model for HCWs' vaccination uptake was modified for the survey guide. The researcher developed a poll that was completed anonymously online. An invitation to participate in the survey along with the questionnaire web link was distributed by utilizing Google Forms and sending it to the selected participants through email or WhatsApp.

Comment [Ma7]: The sentence "This sample will only consist of doctors, nurses, midwives, laboratory technicians, pharmacy technicians, and their assistants" could be rephrased for smoother flow, such as: "The sample includes doctors, nurses, midwives, laboratory technicians, pharmacy technicians, and their assistants"

2.7 Data Processing and Analysis

The majority of the data from the study was descriptive data. After coding the data, the researcher then checked for any potential errors, incompleteness, or inappropriate data. The cleaned data was loaded and imported onto an SPSS version 21 software where the analyzed data was retrieved. To determine the determinants of vaccine hesitancy among the HCWs, a multivariable logistic regression analysis was additionally carried out. Based on the data analysis completed, the conclusion was postulated.

Comment [Ma8]: How did you get the email id and WhatsApp number of the participants, please write in brief

3.0 Results

3.1: Rates of uptake by healthcare workers of the 1st and 2nd doses of COVID-19 vaccine.

According to Figure 1 below, 89 of the respondents representing 46.6% of the interviewees have been vaccinated against COVID-19 while the remaining 102 (53.4%) respondents haven't.

Comment [Ma9]: Since the response is either 'yes' or 'no,' once you've described how many have been vaccinated, it's not necessary to mention the number of those who haven't

Have you received any vaccination against COVID-19? (Waligaa maqaadatay talaalka COVID-19?)
191 responses

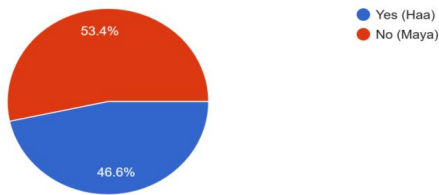


Figure 1: Covid-19 vaccine uptake.

3.2 Types of Covid-19 vaccines taken

As indicated in Figure 2 below, According to the findings, only AstraZeneca and Jansen vaccines were taken by the respondents. Respondents who took the AstraZeneca vaccine were 49 representing 55.1% while the Jansen vaccine was taken by 40 respondents representing 44.9%.

Comment [Ma10]: Since the respondents received only two of the vaccines, there's no need to include Moderna in the index of the figure

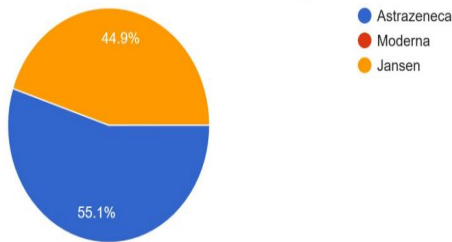


Figure 2: Type of Covid-19 vaccines taken

3.3 Number of Covid-19 doses taken.

As indicated in Figure 3 below, Most of the respondents (47) representing 52.8% had received two doses while the remaining 42 respondents representing 47.2% had taken one dose only.

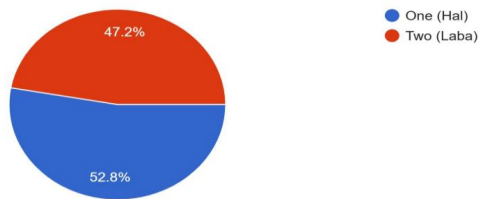


Figure 3: Number of doses of COVID-19 vaccine taken by the respondents.

3.4 Social Demographic Characteristics of the Study Respondents

It was required of the respondents that they identify their gender. According to the examination of the collected data, 101 out of the 191 people who responded to the question were male. This accounted for 52.9 % of responses, with 90 female respondents accounting for the remaining 47.1%. The respondents were asked to state their working station. The data collected indicated that the majority of the respondents representing 107 (56%) worked in Kismayo, 68 respondents representing 35.6% worked in Afmadhow and the remainder 16 respondents (8.48%) worked in Badhadhe. To understand the respondent's baseline demographic, the respondents were asked to state their experience in health-related jobs. Data analysis indicated that among the 191 respondents, the majority, 130 respondents representing 68.1% had a work experience of more than 2 years as shown in figure 4 below, 48 respondents representing 25.1% had a work experience of between 1 and 2 years and the remainder 13 respondents (6.8%) had a work experience of less than 1 year. The majority of the 191 respondents who completed the questionnaire, 66, or 34.6%, had a degree. In addition, 63 respondents, or 32.9%, indicated that they had a diploma, while 13 respondents, or 6.8%, had a high school education. The remaining 49 respondents, or 25.7%, indicated that they had postgraduate qualifications. The data analysis indicates that the majority of the respondents 52.9% earn around 201-400 USD. The least 9 respondents representing 5% earn in the range above 600 USD.

Comment [Ma11]: the presentation of these statistics could be more concise, focusing on key findings rather than listing every detail.

Variable	Categories	Frequency	Valid Percentage%
Age	< 21 years	15	7.9
	21-30 years	76	39.8
	31-40 years	62	32.5
	41-50years	30	15.7
	Over 50years	8	4.1
Gender	Male	101	52.9
	Female	90	47.1
workstation	Kismayo	107	56
	Afmadhow	68	35.6
	Badhadhe	16	8.4
Work experience	Less than 1 year	13	6.8
	1 to 2 years	48	25.1

Table 1:
Social
Demographic
Characteristics of the
Study
Respondents

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Education level	More than 2 years	130	68.1	3.5: Social demographic characteristics associated with the uptake of the COVID-19 vaccine.
	High school diploma	13	6.8	
	Undergraduate professional	63	32.9	
		66	34.6	
Income		49	25.7	
	Less than 200 usd	26	13.6	
	201-400 usd	101	52.9	
	401-600 usd	44	23	
	601-1000 usd	9	5	
	More than 1000usd	11	5.5	

ed with the Uptake of the COVID-19 vaccine.

Results findings in Table 2 indicate that the male HCWs were found to have 1.4 times the likelihood of being vaccinated compared to the female HCWs (OR = 1.4, 95% CI = 0.7878 to 2.473). Similarly, it was discovered that HCWs between the ages of 21 and 50 had a 2.6 times higher chance of being vaccinated compared to those who were below 21 years (OR = 2.6, 95% CI = 0.8027 to 8.5649). It was further discovered that healthcare professionals with postgraduate degrees had 3.7 times higher odds of receiving COVID-19 vaccination compared to those with only high school certificates (OR = 3.7, 95% CI= 0.9228 to 15.3868).

Comment [Ma12]: It is important to note that setting a p-value threshold of less than 0.005 for statistical significance implies that only results with p-values below this threshold should be considered statistically significant. In your analysis, all the variables have p-values greater than 0.005, which indicates that none of the observed differences or associations are statistically significant. Therefore, concluding that certain groups (e.g., male HCWs, HCWs aged 21-50, or those with postgraduate degrees) are more likely to be vaccinated could be misleading, as the results do not meet the criteria for statistical significance. It's crucial to either adjust the conclusion to reflect the lack of significant findings or reconsider the interpretation of the data in light of the established p-value threshold

Table 2. Regression analysis on Demographic characteristics and covid-19 vaccination status

	Odds Ratio	95% C.I	p Value
Gender			
Males	1.3958	0.7878 to 2.473	0.2532
Females	Ref		
Age of respondents			
20 years and below	Ref		
21-50 years	2.6221	0.8027 to 8.5649	0.1105
Above 50 years	1.6500	0.264 to 10.3129	0.536

Comment [Ma13]:

Comment [Ma14]: It should be male, female not males, females

Level of Education			
High school	Ref		
Diploma	2.3423	0.5868 to 9.3507	0.2282
Undergraduate	3.5417	0.8932 to 14.0438	0.0720
Masters/PhD	3.7681	0.9228 to 15.3868	0.0646

4. Discussion

From this study, 46.6% of the study participants had been vaccinated against Covid-19 while the remaining (53.4%) respondents had not been vaccinated. study findings are similar to a study by [12], which concludes that only 48% of the healthcare workers had gotten the vaccine against COVID-19. This was contrary to another study carried out in Ethiopia which reported a higher uptake of COVID-19 vaccines of 61.56% [13]. AstraZeneca was the most received Vaccine, According to Ahmed (2021) the popularity of the AstraZeneca vaccine was because it was the first to be approved for mass vaccination use by the Federal Republic of Somalia MOH. From this study, male study respondents were more likely to be vaccinated for the COVID-19 vaccine as compared to female study respondents. Male healthcare workers may perceive themselves at higher risk of contracting COVID-19 due to their occupational exposure. Studies suggest that a heightened sense of vulnerability can drive the desire to get vaccinated. These findings were contrary to another study carried out in Ethiopia revealed that women were 5.6 more likely to seek the uptake of COVID-19 vaccines as compared to males [14]. Similarly, it was discovered that HCWs between the ages of 21 and 50 had a 2.6 times higher chance of being vaccinated compared to those who were below 21 years. Healthcare workers in the 21-50 age range are more likely to hold positions that involve direct patient care, putting them at higher risk of exposure to COVID-19. This increased risk can motivate them to get vaccinated to protect themselves and their patients. The

Comment [Ma15]: The claim that male healthcare workers and those aged 21-50 are more likely to get vaccinated needs to be supported by statistically significant data; otherwise, these observations should be presented as trends rather than definitive conclusions.

findings from this study agreed with those of a study carried out in Germany where the age of the study respondent was associated with the uptake of the COVID-19 vaccine[15]. Another study carried out in Tanzania was contrary to these findings, where having a young age increased the odds of COVID-19 vaccine uptake by 2[16]. Lastly, it was further discovered that healthcare professionals with postgraduate degrees had 3.7 times higher odds of receiving COVID-19 vaccination compared to those with only high school certificates. The findings were similar to the findings from the study done in Kenya where education level status was associated with the uptake of COVID-19 vaccines, where having a tertiary level of education increased the odds of COVID-19 vaccination[17]. But inconsistent with the findings from a scoping review where education level was not associated with the uptake of COVID-19 vaccines[18].

5. Conclusion

From this research, close to half of the study respondents had been vaccinated with COVID-19 vaccines which is way below bearing this are healthcare workers who are highly exposed to the COVID-19 virus. In addition, male healthcare workers were found to have 1.4 times the likelihood of being vaccinated compared to the female HCWs. Similarly, it was discovered that HCWs between the ages of 21 and 50 had a 2.6 times higher chance of being vaccinated compared to those who were below 21 years. Lastly, healthcare professionals with postgraduate degrees had 3.7 times higher odds of receiving COVID-19 vaccination compared to those with only high school certificates.

8. Ethical Considerations

Before giving the questionnaire to the respondents, the researcher ensured that their verbal consent, as required by the standards of medical ethics. A concise explanation of the study was provided at the very beginning of the questionnaire in order to provide the respondents with further background information. Prior to the administration of the questionnaires, permission was sought from the management of the health facilities. Efforts were made to ensure the results of the questionnaire were available for inspection by the administration of the health facilities and officials who were involved in the investigation. The outcome was not utilized for any purpose other than the one that had been indicated. The researcher ensured that they never interfered with the normal operations of the health facilities. If any respondent had questions or concerns about the questionnaire, they were given the researcher's contact information, including their telephone number for any assistance.

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Comment [Ma16]: The comparison with other studies is useful but would benefit from a clearer discussion on why these discrepancies might exist, particularly when findings are contrary to those in Ethiopia and Tanzania.

Comment [Ma17]: Please clarify how verbal consent was obtained, given that your study was conducted online

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