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Editorial Note

South Asian Journal of Management Research (SAJMR), is a scholarly journal that publishes scientific research on the theory and practice of management. All management, computer science, environmental science related issues relating to strategy, entrepreneurship, innovation, technology, and organizations are covered by the journal, along with all business-related functional areas like accounting, finance, information systems, marketing, and operations. The research presented in these articles contributes to our understanding of critical issues and offers valuable insights for policymakers, practitioners, and researchers. Authors are invited to publish novel, original, empirical, and high quality research work pertaining to the recent developments & practices in all areas and discipline.

Cross-functional, multidisciplinary research that reflects the diversity of the management science professions is also encouraged, the articles are generally based on the core disciplines of computer science, economics, environmental science, mathematics, psychology, sociology, and statistics. The journal's focus includes managerial issues in a variety of organizational contexts, including for profit and nonprofit businesses, organizations from the public and private sectors, and formal and informal networks of people. Theoretical, experimental (in the field or the lab), and empirical contributions are all welcome.The journal will continue to disseminate knowledge and publish high-quality research so that we may all benefit from it.

Dr. Pooja M. Patil
Editor

South Asian Journal of Management Research (SAJMR)

C O N T E N T S

Knowledge, Attitudes and Perceptions towards COVID 19 Vaccinations of Healthcare Professionals' Working in the Yekaand Kotebe Health Centers, Addis Ababa, Ethiopia

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Abstract

Ethiopia began to vaccinate healthcare professionals for COVID-19 with four types of vaccines that have been given permission to use on March 13, 2021. However, understanding healthcare professionals' knowledge, attitude and perception to use and expectations for the COVID-19 vaccination are critical for the government to overcome all obstacles to vaccine delivery and to introduce the most successful vaccination strategy. This study is aimed to assess the knowledge, attitudes, and perceptions towards the COVID-19 vaccinations among the healthcare professionals in the selected health centers in Addis Ababa. Two randomly selected health centers, Yeka and Kotebe, at Yeka sub city in Addis Ababa were sampled. All healthcare professionals working in the two health institutions were included. Validated, structured and self-reporting questionnaires were distributed and filled in by 206 out of 208 healthcare professionals. Data so collected were checked, coded, and entered into Microsoft Excel 2019 and SPSS version 25.0 (Chicago, IL, USA) for cleaning and analysis. Results revealed that the mean percentage ($\pm$SD) of healthcare professionals with good knowledge, positive attitudes and good perceptions about COVID-19 vaccination were, 73.4 ($\pm$ 4.9), 55.5 ($\pm$ 3.5) and 52.1 ($\pm$5.7) respectively. About 61.7% of study participants reported that they were tested for COVID-19 and 48.5% of them had taken the COVID-19 vaccination without any hesitation. Findings from this study indicated that the healthcare professionals considered in this assessment had relatively good knowledge and nearly optimum positive attitudes and perceptions towards COVID-19 vaccinations. Less than half of them had taken the COVID-19 vaccination. It is recommended that awareness creation program through several means (including targeted training to healthcare professionals) must be continued.

Key words: COVID – 19, Vaccination, Knowledge, Attitude, Perception, Healthcare Professionals

Introduction

Background

The first COVID-19 case was identified in Ethiopia on March 13, 2020. COVID-19 infection rates have been accelerating in Africa, including Ethiopia since then. The number of new cases has been rapidly increasing. As of February 13, 2022, the country had 467,498 COVID-19 positive cases and 7,424 deaths ((MoH), 2022). As a result, Ethiopia is now among the top five African countries with the most COVID-19 cases(Abebe, Shitu and Mose, 2021).

Ethiopia's government has been working hard to communicate COVID-19 prevention information through television, radio, and social media (Abebe, Shitu and Mose, 2021). It has used a variety of measures to combat COVID-19, including declaring a state of emergency, imposing mass gathering prohibitions, enforcing stay-at-home order and promoting the use of personal protective equipment (Adane, Ademas and Kloos, 2022).

Several COVID-19 vaccines have been approved for use by WHO. They are being used in a variety of places around the world. In line with this, countries (including Ethiopia) have the autonomy and authority to make use of any health product to domestic emergency situation based on their national regulations and legislation (Al-Zalfawi *et al.*, 2021).

Ethiopia launches a COVID-19 vaccination campaign targeting the 12 years and above population on 16 November 2021.In Ethiopia, four vaccination have been licensed for use. These are (1) Oxford/Astra Zeneca Vaxzevria; (2) Serum Institute of India Covishield (Oxford/AstraZeneca formulation); (3) Sinopharm (Beijing) Covilo, and (4) Pfizer-BioNTech. The government has initially deployed over 28,000 vaccinators

and more than 6.2 million doses of COVID-19 vaccines were distributed for the campaign. Only Pfizer-BioNTech vaccinations were given to children aged 12 to 18 in 62 cities, including Addis Ababa, whereas the other vaccines were given to individuals aged 18 and older across the country in all accessible regions, zones and districts (FMOH, 2022).

Earlier studies indicated that the public's knowledge, attitude and acceptance towards the pandemic and its vaccinations vary from region to region in Ethiopia. Hence, a portion of Ethiopia citizens are hesitant to take vaccines. For example, In February 2021, a comprehensive phone survey of households with 2178 participants was undertaken at the country level. This study indicated a very high rate of COVID-19 vaccine acceptance (92.3%), if vaccination was available for free (Oyekale, 2021). Another interviewer-administered questionnaire was provided to 492 individuals in Gurage zone, Ethiopia in March 2021, showed a lower intention to get COVID-19 vaccination (62.6%) (Abebe, Shitu and Mose, 2021). Another interviewer-administered questionnaire study with 415 participants from Sodo, south-central Ethiopia in April 2021 showed an even lower rate for COVID-19 vaccine acceptance (45.5%), (Mesele, 2021). For healthcare workers, a self-administered questionnaire study that involved more than 400 participants in public hospitals in southwestern Ethiopia in March 2021, showed an intention to get COVID-19 vaccination among 48.4% of the participants (Angelo, Alemayehu and Dachew, 2021). Aiming to improve vaccine uptake, the MoH has launched a communication campaign with support from WHO Ethiopia. Through this campaign, the Ministry is transmitting information and calls to get vaccinated through short messaging system (SMS), different radio stations, and national television. The vaccination campaign was launched nationally as well as in all regions in simultaneous high-level events. As per the National Deployment and Vaccination Plan (NDVP) developed following the WHO Prioritizing Roadmap, frontline health workers and support staff, the elderly with underlying conditions and other high-risk groups have been prioritized for vaccination deaths (FMOH, 2022)

It was on March 13 2021 that the Ministry of Health of Ethiopia launched COVID-19 vaccine at EkaKotebe COVID-19 Hospital, in Addis Ababa where frontline health workers were vaccinated with the AstraZeneca vaccine to mark the beginning of the vaccination campaign. Healthcare workers include medical doctors, laboratory technicians, nurses, midwives, pharmacists, radiographers, anesthesiologists, public health and environmental health officers and any other professionals including staff who work in a healthcare facility. Other than health professionals, non-medical auxiliary employees such as financial workers, and janitors were included (Adane, Ademas and Kloos, 2022).

Literature review Corona virus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Infected people with the virus will experience mild to serious respiratory illness. Most patients recover without requiring special treatment, while others require medical attention and even some others become seriously ill and die. The most common symptoms of the disease include fever, cough, tiredness and loss of taste or smell (WHO, 2021).

COVID-19 is characterized by rapid transmission through the nasal route and can occur by close contact with an infected person. The virus can spread from an infected person's mouth or nose, in small liquid particles when they cough, sneeze, speak, sing or breathe. The important precautionary guidelines for COVID-19 recommended by the World Health Organization (WHO) include: wearing a facial mask, social distancing, and avoiding crowded and poorly ventilated places (Al-Zalfawi *et al.*, 2021).

The WHO in the month of January 2020 announced a public health emergency of international concern and called for a collaborative effort from all countries, including Ethiopia, to contain the spread of the virus (Islam *et al.*, 2021). The reported data from around the world indicates 408 million COVID 19 cases and 5.79 million deaths as of 11 February 2022 (Ritchie, 2020).

The global impact of the COVID-19 pandemic has resulted in an unprecedented level of public interest in vaccines. This includes a focus on the development of vaccines and their regulatory review and safety monitoring. Much of this coverage has taken place through mass and social media. Reports of adverse events (side effects) have led some people to express concerns about getting vaccinated, delay getting vaccinated or even be strongly opposed to vaccination (WHO, 2021).

Nevertheless, the best way to prevent and slow down transmission is to be well informed about the disease, how the viruses spread and get vaccinated and also follow local guidance. Vaccination has been shown to contribute to reducing deaths and severe illness from COVID-19, and to reduce the transmission of COVID-19 (CDC, 2021).

Vaccinating as many people as possible and reducing the spread of disease is important for it protects vulnerable people, including those who cannot receive vaccines, or the small proportion of people who might remain at risk of infection after vaccination. Widespread vaccination will also help prevent people from having to go to hospital and contribute to fewer people getting sick, ultimately alleviating the burden of COVID-19 on healthcare systems Failure to vaccinate widely also enables continued circulation of the virus and the generation of variants, including some that may pose a greater risk (WHO, 2021).

Any vaccination program's effectiveness is dependent on participants' awareness, behaviors, and willingness to accept the COVID-19 vaccine (Abebe, Shitu and Mose, 2021). According to study by(Biswas *et al.*, 2021), the most determinate of intention to use COVID-19 vaccine are age, parity, occupational status, gender, marital status, educational status, income, perceived risk of COVID-19 infection, a healthcare worker, attitude towards, knowledge of COVID-19, being sick with COVID-19, the pre-existence of chronic disease.

Statement of the problem: Vaccines play a critical role in preventing deaths, hospitalization caused by infectious diseases. Emerging data on effectiveness indicates that licensed COVID-19 vaccines are contributing to controlling the spread of the disease. As of 13 February 2022, 12 million total doses of vaccine have been given (distributed) and 1.8 million people are fully vaccinated (which is 1.6% of the total Ethiopian population) so far. (Ritchie, 2020).

Multiple myths and conspiracy theories on vaccines and COVID-19 would also potentially affect the COVID-19 vaccine acceptance in a population (Shitu *et al.*, 2021). The low levels of knowledge, attitude, and low level of intention to accept vaccine for COVID-19 may be a concern of the globe. Since the most efficient means of stopping the virus from spreading is by protecting oneself from being infected to COVID-19, it is also important to vaccinate persons who are the most vulnerable as quickly as possible (Islam *et al.*, 2021).

Healthcare professionals and public health authorities have a central role in discussing vaccination against COVID-19 with their patients. Their knowledge, attitude and perception to use and expectations for the COVID-19 vaccine are critical for government and policymakers to overcome all obstacles to vaccine delivery; and to introduce the most successful vaccination strategy in Ethiopia (Abebe, Shitu and Mose, 2021). Reluctance of healthcare professionals to accept COVID-19 vaccination may not only increase the risk of virus transmission to their patients but also reduce the likelihood that these professionals will encourage patients to be vaccinated (Adane, Ademas and Kloos, 2022). In this study assessment was made to analyze the healthcare professionals' levels of knowledge, attitudes and perceptions on the selected health institutions in Addis Ababa, Ethiopia.

Significance of the study

Understanding the levels of good knowledge, positive attitudes and perceptions of frontline workers are crucial information for decision makers leading the COVID-19 vaccination campaign. Therefore, findings from this study can be used by Federal Ministry of Health (MoH) and other health institutions involved

1. To introduce the most successful vaccination strategy across the country; and overcome obstacles to COVID-19 vaccine delivery.
2. To organize additional awareness creation program through several information communication means (including targeted training to healthcare professionals).

Objectives of the study

Analyzing knowledge, attitudes and other issues of perception among healthcare professionals based on facts and figures on practices is a scientific way for developing strategies. Consequently, this study had the following general and specific objectives.

General objective

The general objectives of this study were to assess the knowledge, attitudes, and perceptions towards the COVID-19 vaccination among the healthcare professionals' in the Yeka and Kotebe health centers in Addis Ababa, Ethiopia.

Specific objectives The specific objectives of this study were:

1. To evaluate the level of knowledge to COVID 19 vaccinations of healthcare professionals working in the two health centers
2. To determine whether the healthcare professionals working in the two health centers were tested for COVID-19 vaccine and got vaccinated
3. To analyze the magnitude of positive attitudes and perceptions towards COVID 19 vaccinations of healthcare professionals working in the two health centers

Methodology

Study area

This study was conducted in Addis Ababa, the capital city of Ethiopia. Addis Ababa is geographically located at 9.005401 latitude, and 38.763611 longitudes. It is one of the largest cities in Africa and inhabited by people of various origins. currently it has an estimated population of about 5 million. The new administrative structure of Addis Ababa has 11 sub-cities, and Yeka sub city, where the selected health centers are situated, is one among them (EiABC, 2018). According to the 2012 (Ethiopian Fiscal Year) Health and Health Related Indicators published by MoH, Addis Ababa has 13 Hospitals, 98 Health Centers.

Study design and period

A survey was conducted on the two randomly sampled health centers (Yeka and Kotebe) at Yeka sub city in Addis Ababa. The study covered a three months period ranging from March to May 2022. Actual data collection was done in the month of April 2022.

Source of population

All health professionals working in the above two health centers were considered.Data available in the Human Resource Departments (HRDs) of the two health centers was extracted to determine the number of participants. Healthcare professionals (Physicians,Nurses, Midwives, Anesthesiologist, Health officers, Pharmacists, radiographers, environmental health specialists,Biomedical Laboratory Technologists, Community health workers and others) were included. The combined population size of all healthcare professionals in the two health centers was the source population.

Study population

All healthcare professionals (208) working in the two health centers were considered.

Inclusion and Exclusion Criteria

The inclusion criteria of participants were i) being a health professional and ii) providing consent. Those who were absent (on sick leave, annual leave, or maternity leave) were excluded.

Sampling and sample size determination

From the two randomly sampled health centers, all healthcare professionals, 208 (77, YHC and 131, KHC) were sampled.

Study variables

The dependent variables, in this study, were knowledge, attitudes, and perceptions. To compute the three outcome variables of knowledge (good or poor), attitude (positive or negative), and perception (good or

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poor), I used the mean score of responses to 9 questions about knowledge, 6 questions about attitude and 9 questions about perceptions as independent variable.

Data collection

I adapted a validated questionnaire as used in [(Islam *et al.*, 2021),(Adane, Ademas and Kloos, 2022) and (Abebe, Shitu and Mose, 2021)] and modified to suit to our study (see appendix for sample questionnaire distributed to individual respondents). This structured and self reporting questionnaire has four sections (i.e., socio-demographics, knowledge, attitudes, and perceptions)

Data management, coding, analyses and data collectors

The **knowledge section** comprises 8-items with three possible responses (i.e., "Yes", "No" and "Don't know"). The 'yes' responses were coded as 1, while the 'No' responses were coded 2 and 'don't know' responses were coded as 3. The frequency (*n*) was obtained by summating the raw scores for each of the eight items and proportions from total number of respondents were obtained as percentage for each category. The mean percentage for all knowledge items was also calculated. In addition, an additional variable was asked about knowledge of healthcare professionals about the mode of transmission of COVID-19 with some possible answers (e.g., poor hygiene, inhalation of the virus, touching contaminated surfaces, eyes, nose or mouth; and shaking hands, hugging, and kissing).The overall knowledge of participants toward COVID-19 was obtained as having "good knowledge" or "poor knowledge".

The **attitude section** consists of 6-items (e.g., the newly discovered COVID-19 vaccine is safe; I will take the COVID-19 vaccine without any hesitation, if it is available), and the response of each item was coded 1 = Disagree, 2 = Undecided, and 3 = Agree). The frequency (*n*) was obtained by summating the raw scores for each of the six items and proportions from total number of respondents were obtained as percentage for each category. The mean percentage for all attitude items was also calculated.

The **perceptions section** includes 9-items regarding participant's perceptions towards the COVID-19 vaccine, with three possible responses (i.e., "Yes", "No" and "Don't know")**;** and The 'yes' responses were coded as 1, while the 'No' responses were coded 2 and 'don't know' responses were coded as 3. The frequency (*n*) was obtained by summating the raw scores for each of the nine items and proportions from total number of respondents' were obtained as percentage for each category. The mean percentage for all perception items was also calculated and the level of good perceptions towards COVID-19 vaccinations was determined.

Data collection was carried out by Sister Seblewengele Hailu (healthcare professional) working at KHC. And w/rt TenayeFisiha (Civil Servant at Ethiopian Civil Service University - ECSU) collected data from YHC.

Quality assurance

Data were collected through a validated self-administered questionnaire adapted from relevant literature. To ensure the collection of reliable data, data collectors were trained by the researcher for half a day on the objectives of the study, the content of the questionnaire and ethical issues.

I also pre-tested the questionnaire on healthcare professionals in Kotebe clinic before actual data collection.

Statistical analysis

The data analysis was performed using Microsoft Excel 2019 and SPSS version 25.0 (Chicago, IL, USA). Microsoft Excel was used for data cleaning, editing, sorting, and coding. The excel file was imported into SPSS software. Descriptive statistics such as frequencies, percentages mean, and standard deviations) were performed.

Ethical considerations

The study was conducted after getting an ethical clearance from Ethical Committee at the health Bureau, city government of Addis Ababa. Further, permission was obtained from, Yeka sub city Health Office. The study

participants' were informed about the aim of the study and also given orientation on the importance of their participation in the study. The information obtained from the respondents was kept confidential.

Results

Socio-demographic characteristics of respondents

The socio-demographic characteristics of the participants are represented in tables- 1A, 1B and 1 C. Of the 208 healthcare professionals participated, the response rate was 206 (99%) with very few items were not responded to by participants and recorded as missing data. In the age group category, the majority of the respondents 155 (76.4%) were Adults, aged above >25 years and the remaining 48 (23.6%) were young, (18-25years); and 84 were male (40.8%) and 122 females (59.2%). Among 51.6% were married. The respondents majority were university degree holders or even higher 146 (72.3%) and 56 (27.7%) possessed College diploma (refer to table-1 A).

Table 1- A: Background (Socio- educational) of the samples in the Yeka and Kotebe Health Centers, Addis Ababa, April 2022.

No	Variables	Frequency (*n*)	Percentage (%)
1	**Sex (*N* = 206)**		
	Male	**84**	**40.8**
	Female	**122**	**59.2**
2	**Age (Years) (*N* = 203)**		
	Young (18-25Years)	**48**	**23.6**
	Adult (>25 Years)	**155**	**76.4**
3	**Marital Status (N = 192)**		
	Single	87	45.3
	Married	99	51.6
	Divorced /Separated	6	3.1
4	**Educational status (*N* = 202)**		
	Diploma	**56**	**27.7**
	University Degree /Higher	**146**	**72.3**

The study participants included 7 (3.4%) medical doctors, 22 (10.7%) laboratory technicians, 92 (44.9%) nurses and midwives, 19 (9.3%) pharmacists, 3 (1.5%) radiographers, 12 (5.9%) anesthesiologists, 32 (15.6%) public health officers, 3 (1.5%) environmental health specialist and 15 (7.3%) community health specialist. In terms of experience in the service facility, 134 (65.4%) possessed an experience of 10 years or more while remaining 71 (34.6%) had less than 10 years' job experience in the facility (refer table-1b).

Table 1- B: Medical professionals and their experience in the service/ facility at Yeka and Kotebe Health Centers, Addis Ababa, April 2022.

NO	Variable	Frequency (n)	Percentage (%)
1	Professionals (N=205		
	Medical Doctor	7	3.4
	Laboratory Technician	22	10.7
	Nurse and Midwives	92	44.9
	Pharmacist	19	9.3
	Radiographer	3	1.5
	Anesthesiologist	12	5.9
	Public Health Officer	32	15.6
	Environmental Health Specialist	3	1.5
	Community Health Specialist	15	7.3
2	Years of service in the facilities (N = 205)		
	10 or less	134	65.4
	>10	71	34.6

In terms of background history, test results of CIVID-19, and access to any training or orientation programs reveal that respondents' knowledge about the history of COVID-19 positive cases in the family, among colleagues or friends was 'yes' in as much as 128 cases (62.4%); whereas remaining 77 cases (37.6%) responded 'no' to the question. It means that a large majority of the sample respondents were aware about

the presence of COVID cases in the city as part of their knowledge in the family, among colleagues or friends. Similarly, a majority of 171 (83.4%) of respondents did not have any chronic condition while 34 (16.6%) had one or more these diseases such as hypertension, asthma, diabetes, and/or kidney disease. About 127 (61.7%) of study participants reported that they were tested for COVID-19 and the remaining 79 (38.3%) did not. More than half 110 (53.7%) had received training or orientation about COVID-19 vaccination; while 95 (46.3%) responded 'no' to this question (refer Table 1 C).

Table 1- C: Background history, test results of COVID – 19, and access to any training or Orientation in Yeka and Kotebe Health Centers, Addis Ababa, April 2022

NO	Variable	Frequency (n)	Percentage (%)
1	**History of COVID-19 positive cases in the family, among colleagues or friends ($N = 205$)**		
	Yes	128	62.4
	No	77	37.6
2	**I have chronic diseases ($N = 205$)**		
	Yes	34	16.6
	No	171	83.4
3	**I have been tested for COVID-19 ($N = 206$)**		
	Yes	127	61.7
	No	79	38.3
4	**If 'Yes', were you positive ($N = 127$)**		
	Yes	73	57.5
	No	54	42.5
5	**I received any training or Orientation about COVID 19 Vaccination ($N = 205$)**		
	Yes	110	53.7
	No	95	46.3

Healthcare professionals' knowledge about COVID-19 vaccination

The distribution of each knowledge item about the COVID-19 vaccination is presented in Table2-A, and table 2-B. The mean percentage (±SD) of healthcare professionals with good knowledge was 73.4 (± 4.9). The majority 171 (83%) responded that COVID-19 is a serious disease. One hundred thirty-seven (67.1%) of the participants had been aware of the development of the COVID-19 vaccine and 145 (69.7%) stated that vaccine could have side effects that result in many health complications. Half of the respondents, 104 (50.5%) knew about the effectiveness of the developed COVID-19 vaccine. More than half, 130 (63.4%) of the study participants had responded that the overdose of COVID-19 vaccine would become dangerous for humans. One hundred seventy (82.9%) of the participants expressed that older people and chronic disease patients are most likely to experience severe illness and death from COVID-19 infection; and 173 (84%) responded that healthcare professionals are more vulnerable to COVID-19 infection than the general public.

Table 2-A: Knowledge of health care professionals about COVID-19 vaccine in the Yeka and Kotebe Health Centers, Addis Ababa, April 2022.

NO	Variable	Frequency (n)	Percentage (%)
1	**I know about the COVID- 19 vaccine and its development ($N = 204$)**		
	Yes	137	67.1
	No	45	22.1
	Don't Know	22	10.8
2	**Knowledge of Health Care Professionals about the mode of transmission of COVID-19 (Multiple Responses are possible) ($N = 206$)**		
	Poor Hygiene	119	57.8
	Inhalation of the Virus	132	64.1
	Touching Contaminated Surfaces, eyes, nose, mouth	167	81.1
	Shaking Hands, Hugging, and Kissing	134	65.1
3	**COVID-19 is a serious disease ($N = 206$)**		
	Yes	171	83
	No	29	14.1
	Don't Know	6	2.9

4	**Vaccines Effectively Prevent COVID-19** (*N=206*)		
	Yes	104	50.5
	No	70	34
	Don't Know	32	15.5
5	**Overall knowledge towards COVID-19** (*N = 204*)		
	Good	153	75
	Poor	51	25

Further, as many as one hundred twenty five (60.6%) have considered that COVID-19 be acquired after full vaccination. More than three-quarters 167 (81.1%) of healthcare professionals considered the major mode of COVID-19 transmission to be touching contaminated surfaces and touching one's eyes, nose, and mouth, followed by shaking hands, hugging, and kissing 134 (65.1%), inhaling the virus 132 (64.1%), poor hygiene 119 (57.8%). The overall good knowledge of the healthcare professionals about COVID-19 and its vaccine was rated 153 (75%) whereas the remaining 51 (25%) had rated as having poor knowledge (table 2A).

A study on the vulnerability to COVID-19 infection (refer table 2-B) reveals that as much as 125 respondents (60.6%) replied as 'yes', whereas 55 (27.1%) replied as 'no' while 23 (11.3%) as 'do not know'. Similarly response to another question whether COVID-19 vaccines have side effects? A majority of the respondents 145 (71.1%) replied as 'yes' whereas 39 (19.1%) replied 'no' and remaining 20 (9.8%) as don't know. It means side effects of COVID-19 were recognized by a majority. Similar was the response for the use of overdose of vaccines. As many as 130 (63.4%) said as 'yes' 47 as 'no', while 28 as don't know'. With reference to older people and chronic disease patients experiencing severe illness and death from COVID-19 infection; the response was overwhelmingly 'yes' in as many as 170 (82.9%); 'no' in case of 24 (11.7%) and remaining 11 (5.4%) as don't know. Elaborating issue towards deeper insights; question was healthcare professionals are more vulnerable to COVID-19 infection than general public? The response was extremely high. As many as 173 (84%) replied as 'yes'; 22 as 'no' and remaining 11 (5.3%) as 'don't know'.

Table 2 B: Vulnerability to COVID-19 infection in the Yeka and Kotebe Health Centers, Addis Ababa, April 2022.

NO	Variable	Frequency (n)	Percentage (%)
1	**COVID-19 can be acquired after full Vaccination** (*N=203*)		
	Yes	125	60.6
	No	55	27.1
	Don't Know	23	11.3
2	**COVID-19 Vaccines have side effects** (*N=204*)		
	Yes	145	71.1
	No	39	19.1
	Don't Know	20	9.8
3	**It is dangerous to use overdose vaccines** (*N = 205*)		
	Yes	130	63.4
	No	47	22.9
	Don't Know	28	13.7
4	**Older people and chronic disease patients most likely to experience severe illness and death from COVID-19 infection** (*N = 205*)		
	Yes	170	82.9
	No	24	11.7
	Don't Know	11	5.4
5	**Healthcare professionals are more vulnerable to COVID-19 Infection than the general public** (*N=206*).		
	Yes	173	84
	No	22	10.7
	Don't Know	11	5.3

Healthcare professionals' attitudes towards COVID-19 vaccination

The distribution of each of the attitudes items towards the COVID-19 vaccine is presented in Table 3. The mean percentage (±SD) of healthcare professionals with positive attitude was 55.5 (±3.5). Less than half, 90 (44.1%) of the participants had agreed that the newly developed COVID-19 vaccine was safe. Nearly two-

third, 128 (63%) of the participants had also agreed that the COVID-19 vaccine was essential for us. Ninety-seven, (48.5%) of the participants had expressed that they have taken the COVID-19 vaccine without any hesitation. Almost two-third, 130 (63.7%) of the respondents had agreed to encourage family/friends/relatives to get vaccinated. Similar proportion like in the above item, 130 (63.7%) of the respondents had agreed that it is not possible to reduce the incidence of COVID-19 without vaccination. Half, 101 (50%) of the participants agreed that the COVID-19 vaccine should be distributed fairly to all of us.

Table 3: Attitudes towards COVID-19 vaccines among healthcare professionals in the Yeka and Kotebe Health Centers, Addis Ababa, April 2022

No	Variables	Frequency (n)	Percentage (%)
1	**The Newly discovered COVID-19 vaccine is safe ($N = 204$)**		
	Disagree	46	22.6
	Undecided	68	33.3
	Agree	90	44.1
2	**The COVID-19 vaccine is essential for us ($N = 203$)**		
	Disagree	33	16.3
	Undecided	42	20.7
	Agree	128	63
3	**I have taken the COVID-19 vaccine without any hesitation ($N = 200$)**		
	Disagree	64	32
	Undecided	39	19.5
	Agree	97	48.5
4	**I will also encourage my family /friends/ relatives to get vaccinated ($N = 204$)**		
	Disagree	42	20.6
	Undecided	32	15.7
	Agree	130	63.7
5	**It is not possible to reduce the incidence of COVID-19 without vaccination ($N = 204$)**		
	Disagree	42	20.5
	Undecided	32	15.7
	Agree	130	63.7
6	**The COVID-19 Vaccine should be distributed fairly to all of us ($N = 202$)**		
	Disagree	56	27.7
	Undecided	45	22.3
	Agree	101	50

Healthcare professionals' perceptions about COVID- 19 vaccination

The distribution of each perceptions item about COVID-19 vaccination is presented in Table 4- A and 4- B. The mean percentage (±SD) of healthcare professionals with good perceptions was 52.1 (±5.6). Very few, 15 (7.4%) of the healthcare professionals considered themselves to be at high risk of becoming infected with COVID-19 and 103 (50.2%) of them thought that they could get infected with COVID-19 through vaccination. On the other hand, 92 (45.8%) of the respondents accepted that it is possible to reduce the incidence of COVID-19 without vaccination. Nearly half, 97 (48.5%) of the healthcare professionals thought that vaccines could worsen any pre-existing medical conditions. Again one hundred forty two (70.6%) agreed that getting vaccinated on his/her own for COVID -19 is a good way to protect his/her family and other people against infection. More than half, 119 (59.8%) of them had the opinion that their families and friends think that getting vaccinated for COVID -19 is a good idea.

Over half of participants 114 (57.3%) responded that they could get proper medical care if contracted COVID-19; and nearly two third of the respondents 131 (65.2%) accepted that the development of COVID-19 vaccines was properly carried out to make them safe. One hundred twenty-eight (63.7%) had good perception to get vaccinated (refer table 4-A).

Table 4-A: Perception towards COVID-19 vaccine among healthcare professionals in the Yeka and Kotebe Health Centers, Addis Ababa, April 2022

No.	Variables	Frequency (n)	Percentage (%)
1	**I believe that I can get proper medical care if I contract COVID-19 (*N*=199)**		
	Yes	114	57.3
	No	42	21.1
	Don't Know	43	21.6
2	**I think that the development of COVID-19 vaccines was properly carried out to make them safe (*N* = 201)**		
	Yes	131	65.2
	No	23	11.4
	Don't Know	47	23.4
3	**My family and Friends think that getting vaccinated for COVID -19 is a good idea (*N* = 199)**		
	Disagree	39	19.6
	Undecided	41	20.6
	Agree	119	59.8
4	**Most of my colleagues appear to think that getting vaccinated is a good idea (*N* =201)**		
	Yes	128	63.7
	No	39	19.4
	Don't Know	34	16.9
5	**Getting myself vaccinated for COVID -19 is a good way to protect your family and other people against infection (*N* = 201)**		
	Yes	142	70.6
	No	41	20.4
	Don't Know	18	9

Further making an in depth inquiry into the analysis of questions pertaining to negative perceptions among medical professionals about getting vaccinated has been presented in table 4-B. There are four specific questions to assess the negative perceptions among medical professionals. On the first question of being at high risk with COVID-19 infection; results reveal that 139 accounting for about 69.2% medical professionals disagreed with the idea. On the contrary, 47 (23.7%) were 'un decided'. However, 15 accounting for 7.4% replied as 'agree' to the question. Similarly, as many as 103 respondents (51.2%) replied 'yes' to the second question of getting infected with COVID-19 through vaccination. Contrary to the above, there was a 'no' response to this question as well and as many as 77 respondents forming 38.3% of the total responded 'no' to this question. On the other hand, 21 (10.5%) replied as 'don't know' as their response to the second question. The third question in the series related to the perception that it is possible to reduce and control the incidence of COVID-19 without vaccination. As many as 92 respondents, forming 45.8% of the total sample respondents, reported 'yes' to the question. On the contrary 73 (36.3%) responded 'no' on the question. Remaining 36 (17.9%) replied as 'don't know'. The result shows that there is a prevailing misconception and negative perception towards reduction and control measures of COVID-19 without vaccination among medical professionals in the study areas. The fourth question, in the series, was related to the perception that COVID-19 vaccine can worsen any health condition of an individual. The response to this question was 'yes' in cases of 97 respondents accounting for 48.5% of the total; 'no' in cases of 61 (30.5%); and 42 (21%) in cases of 'don't know'. Results further substantiate that there is a negative perception among a large number of medical professionals towards COVID -19 vaccines that it can worsen their existing health condition.

Table 4 -B: Negative perception of medical professionals about getting vaccinated for COVID-19 in the Yeka and Kotebe Health Centers, Addis Ababa, April 2022.

No	Variable	Frequency (n)	Percentage (%)
1	**I think I am at high risk of becoming infected with COVID-19 (*N* = 201)**		
	Disagree	139	69.2
	Undecided	47	23.4
	Agree	15	7.4
2	**I think that I could get infected with COVID-19 through vaccination (*N* = 201)**		
	Yes	103	51.2
	No	77	38.3
	Don't Know	21	10.5
3	**It is possible to reduce and control the incidence of COVID-19 without vaccination (*N* = 201)**		
	Yes	92	45.8
	No	73	36.3
	Don't Know	36	17.9
4	**I think that COVID -19 vaccine can worsen any health conditions I have (*N* = 200)**		
	Yes	97	48.5
	No	61	30.5
	Don't Know	42	21

Discussions

The present study evaluated the knowledge, attitudes, and perceptions of the COVID-19 vaccination among healthcare professionals in the Yeka and Kotebe Health centers in Addis Ababa. The study group is comprised of either sex with different ages, educational backgrounds and professions (Table 1). The study suggested that the healthcare professionals that took part in the survey had the overall good knowledge about COVID-19 and its mode of transmission. They were aware of the development of the COVID-19 vaccine, its dosage, the possible side effects, and the non-recommended group of people for vaccination (Table 2).

The mean percentage level of good knowledge towards the COVID-19 vaccine of healthcare professionals was found to be 73.4%; in this study. This finding is in agreement with similar a study conducted in Ethiopia, i.e. 74% by (Abebe, Shitu and Mose, 2021). The similar research setting and the availability and accessibility of health service infrastructures may be the possible reason for the similarity observed.

In the 'attitude' domain, the study group indicated an overall positive response to the COVID-19 vaccination. They had agreed to encourage family/friends/relatives to get vaccinated. They had also had the idea that it is not possible to reduce the incidence of COVID-19 without vaccination and hence the COVID-19 vaccine should be distributed fairly to all of us (Table 3).

In this study, the level of positive attitude towards the COVID-19 vaccine was found to be (55.5%). Hence, this is higher than the earlier study conducted in Ethiopia, i.e. 44.7% by (Abebe, Shitu and Mose, 2021) and nearly in agreement (52.3%) with the study by (Adane, Ademas and Kloos, 2022). The similarity of this finding with the later might be explained by the similarity in socio-demographic characteristics of the study participants and method used in the study.

In the 'perception' category, the contributors revealed that they were considered themselves to be at low risk of becoming infected with COVID-19 but again believe that they could get infected while received vaccination. The respondents accepted that it is possible to reduce the incidence of COVID-19 without vaccination if adhering to safety measures. Some even had the perception that vaccines could worsen any pre-existing medical conditions. Whereas, above two third agreed that getting vaccinated on his/her own for COVID -19 is a good way to protect his/her family and other people against infection; and 63.7% had the opinion getting vaccinated for COVID -19 is a good idea (Table 4).

The overall good perception about the COVID-19 vaccination was (52.2%) in this study. This level of good perception observed was lower than two earlier studies conducted both one in the Saudi Arabia (71.3%) by (Al-Zalfawi *et al.*, 2021) and in Ethiopia (60.5%) by (Adane, Ademas and Kloos, 2022).

Limitation of the study

This study is limited in its scope to the two health centers, Yeka and Kotebe, at Yeka sub city in Addis Ababa. The study evaluated the responses of only 208 healthcare professionals working in the above-mentioned health institutions. The study covered only three months period ranging from 1 March to 30 May 2022. Authors have used only descriptive statistics in the data analysis and finding from this study may not be generalized to all Health Centers in Addis Ababa.

Conclusion

Any vaccination program's effectiveness is dependent on participants' knowledge, behaviors, and willingness to accept the vaccine. This study was, therefore, conducted to assess the knowledge, attitudes, and perceptions of healthcare professionals towards the COVID-19 vaccination. The study indicated that the healthcare professionals considered in the assessment have relatively good knowledge (73.4%) and nearly optimum positive attitudes (55.5%) and perceptions (52.2%) towards COVID-19 vaccinations. However, only 48.5% of the participants had taken the COVID-19 vaccine without any hesitation.

Recommendation

Based on the findings from this survey, I recommend that the awareness creation program through several means' (including targeted training to healthcare professionals) should be continued, which has proven to play an important role in communicating information about the safety and efficacy of vaccines to different groups of the population.

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