Predictors Of Willingness to Accept Covid-19 Vaccine Among Adult Clients Attending Bule Hora University Teaching Hospital, West Guji Southern Ethiopia

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Abstract

Background: Vaccines are effective and ultimate solution that can decrease the burden of Coronavirus disease-19 worldwide. However, poor knowledge and unwillingness to accept this vaccine are key barriers to manage the coronavirus disease-19 pandemic in different country including Ethiopia. The control of pandemic principal will depend on acceptance of coronavirus disease vaccine. Therefore, there is paucity of evidence on coronavirus disease vaccine acceptance in the study area. The current study was aimed to assess willingness to accept coronavirus disease-19 vaccine and associated factors among adult clients attending Bule Hora University Teaching Hospital, west Guji zone, southern Ethiopia.

Methods:

Institution based cross sectional study was conducted among 385 study participants which was selected by Systematic random sampling technique. Data was collected through observation and structured questionnaires from April 10 to May 30, 2022. The collected data was cleaned and entered into Epi data 3.1 software before being exported to SPSS 25 statistical software for analysis. Bi-variable and multi-variable binary logistic regression model was used to identify the predictors of coronavirus disease-19 vaccine acceptance. The strength of association was measured using AOR with 95% confidence interval and significance was declared at p- value < 0.05.

Result: Magnitude of willingness to accept coronavirus disease-19 vaccine was 67.5 % (95%Cl: 63 -72). Good knowledge (AOR= 2.07, (1.17-3.64), history of chronic disease (AOR= 2.59(1.4-4.78) government employee (AOR= 2.35(1.1-5), favorable attitude (AOR= 14.15(5.25-37.46) and good adherence (AOR=1.74(1.023-2.97) were factors that significantly associated with willingness to accept coronavirus disease-19 vaccine.

Conclusion: Magnitude of willingness to accept coronavirus disease-19 vaccine was considerable and needs to be improved. Knowledge, attitude, chronic illness, adherence, and being government employee were factors that associated with willingness to accept coronavirus disease-19 vaccine. Community awareness, advocacy, social mobilization and health education should be given at different levels.

Keywords: willingness; COVID-19, vaccine; acceptance; ethiopia

Introduction

A COVID-19 vaccine is a vaccine intended to provide acquired immunity against severe acute respiratory syndrome coronavirus 2 (SARSCoV-2), the virus that causes coronavirus disease 2019[1]. Vaccines are life-saving inventions that have been responsible for the suppression and control of many infectious diseases in many parts of the world [2]. In addition to providing direct immunity and preventing disease among vaccinated individuals, they have been shown to protect unvaccinated individuals through herd immunity, if a greater proportion of the population is immune [2].As the number of cases of coronavirus disease (COVID-19) is increasing world-wide, promising COVID-19 vaccine candidates are being produced, like Astra Zeneca, Johnson and Johnson and Sino pharm and Pfizer vaccine to fight the coronavirus disease

(COVID-19) pandemic, researchers from all over the world have made remarkable efforts to create vaccines against the disease [3–5].

After the incidence of COVID- 19, pandemic WHO and health care institutions are working on prevention, diagnosis, and treatment including the development of COVID-19 vaccine were manufactured with one year after WHO confirmed COVID-19 to be the global public health emergence. Due to outstanding determination in vaccine research COVID-19 vaccine were developed within short period of time in vaccine history [6]. Astra Zeneca vaccine is one of vaccine developed in serum Institute of India (SII) were provided to Ethiopia on 6 march 2021 with the aim of reduction of recent COVID-19 infection [6]. The COVID-19 Vaccines Global Access (CovAx) facility allocated 7,620,000 doses of COVID-19 vaccine for Ethiopia of which about 2,184,000 doses were already received [7]. According to recent Global delivery plan, 5.4 million doses of the COVID-19 vaccine are expected to reach Ethiopia by May 2021, according to the ministry of health aim 20% of the population in Ethiopia is planned to be vaccinated by the end of 2021[8].

Thus, the main source of vaccine hesitance may be due to considerable amount of misinformation regarding the COVID-19 vaccine that was flowing on social media [9]. Globally, Willingness to accept the COVID-19 vaccine, reported to be 71.7% in the United Kingdom [10], and range from 31–74% in Hungary, Japan and Israel [11]. The willingness to take COVID-19 vaccine was found to be 40% in china [12]. In Africa around 63% of all participants surveyed were eager to accept the COVID-19 vaccine [13]. Systematic review and meta-analysis in Ethiopia revealed that over all magnitude of COVID-19 vaccine acceptance was 56.02% [14].

Therefore, vaccine up take can be influenced by various risk factors including perception that cause adverse effect, attitude towards vaccination, knowledge of vaccine, misconception, fear of unforeseen side effect, social influence and trust in the health care professional and having increased information about COVID-19 vaccine [15]. Being female, older age, marital status, residence, occupations, not having a health-related job, religion, educational status were statistically significantly associated with willingness to receive the COVID-19 vaccine [16].

However, poor knowledge and unwillingness to receive vaccination is potential barrier to handle the COVID-19 pandemic in long term and cause a heavy burden of morbidity, mortality and economic crisis around Globe. Since, vaccination are central to the control of COVID-19 its' success relies on having safe and effective vaccination and also high level of vaccine up take by public over time [17, 18]

Globally, over 1.3 million doses of COVID-19 vaccine have been ordered with 4.1% of the individuals being fully vaccinated as of 10 May 2021[19]. In Africa with 49 countries now rolling out COVID-19 vaccines, as of May 2021, more than 30 countries have less than 1% coverage with a continental average of 2.5% [20]. Ethiopia received about 2.2 million doses of AstraZeneca COVID-19 vaccines in March, 2021 and sources disclose that close to 1.9 million people in Ethiopia have already been vaccinated for the first dose of AstraZeneca [21].

In Oromia, currently around 42.2% of health workers were accepted COVID-19 vaccine [22]. The suppression of the ongoing community spread of COVID-19 disease is only possible with adequate vaccine coverage to develop herd immunity within community and through mass media and non-governmental agency like WHO, government are continuously working to build vaccine literacy among the public to accept the vaccine when is available and appropriate [23]. Regardless of this effort to reduce the burden of COVID-19 via vaccination and other measure, unwillingness to take COVID-19 vaccine was increased worldwide and hindering the effort to control its spread [24].

However, knowledge, attitude toward COVID-19 vaccine, adherence level to mitigation measures, presence of chronic disease was not well known in the southern part of Oromia and study area [3, 25]. Therefore,

the current study was aimed to assess willingness accept COVID-19 vaccine and its predictors.

Materials and Methods

Study design and setting

A cross sectional study was conducted at Bule Hora university teaching hospital west Guji zone, Oromia, south Ethiopia from April 10 to May 30, 2022. It is 467 kilometers from Addis Ababa. The hospital served around 1,568,547 people and employed 408 staff (117 administrative and 233 are clinical staffs). In the year 2021, about 3528 patients will be served in the outpatient service at Bule hora teaching hospital.

Inpatient services at Bule Hora University Teaching Hospital include obstetric, gynaecologic, and neonatal intensive care units, as well as medical and surgical wards. Outpatient services include ANC, Post-natal care, ART clinic, PMTCT, Family planning, ophthalmology care, psychiatry, dental care, Cervical Cancer screening, Under-5 OPD, Emergency OPD, and Adult OPD's. Additional services include laboratory and pharmaceutical services, as well as US and x-ray services.

Population and Sampling

All clients aged ≥ 18 years attending Bule Hora University teaching hospital were source population while, all randomly selected client aged ≥ 18 years attending Bule Hora University teaching hospital during data collection time were study population. Those clients who had got vaccinated were excluded.

The samples size for the first objective was calculated by using a single population proportion formula considering 59.4% [26] proportion of willingness to receive COVID-19 vaccine from previous study with assumptions of confidence level at 95%, a margin of error (d) 5% and adding 10% for non-response as follows:

The sample size for the second specific objective was determined by considering factors that were significantly associated with the outcome variable, two-sided confidence level of 95%, the margin of error of 5%, power of 80% and the ratio of exposed to unexposed 1:1 using EPI-Info software. Considering 10% for nonresponse the final sample size for the second objective was determined. Hence, the largest sample size was taken from first objective, 385.

Six out patients' departments were chosen from a total department in the hospital using a simple random sampling technique by lottery method. A systematic random sampling procedure was used to choose clients from these six out patients departments that were chosen; the first clients was selected using a simple random sampling technique, and then others were selected at 9 regular intervals until the required sample size was reached.

Data Collection Procedure and Instrument

The data were collected through interview and observation using a pre-tested structured questionnaire, which was adapted from published papers [16, 25–27]. It consists of four sections including, socio-demographic characteristics, knowledge about COVID-19 vaccine, attitude towards COVID-19 vaccine, adherence to ward COVID19 mitigation measures, and willingness to receive COVID-19 vaccine. Prior to data collection, two days training was given for data collectors and supervisors on the study objectives, subject eligibility criteria and data collection methods. The data was collected by 6 BSc nurses and supervised by 2 BSc nurse.

Study Variables and measurement

Outcome variable

Willingness to accept COVID-19 vaccine

Independent variables

Socio demographic factors: age, sex, educational status, income, occupation status, marital status, residence sand ethnicity.

Knowledge of COVID-19 vaccine, adherence to ward COVID-19, attitude toward COVID-19 vaccine, and information about COVID-19 vaccine.

Operational Definition

Willingness Mean a state of being prepared or readiness to receive COVID19 vaccine. COVID-19 vaccine acceptance was measured using "Yes" and "No" questions, the participant was asked "Are you willing to be vaccinated against COVID-19?" [26]

Knowledge Has eight items that was used to assess knowledge level of client about COVID-19 vaccine. Those who correctly answered the question, coded as "1", while incorrect one was given "0" values. Participant who scored 70% and above was considered as having good knowledge while those who scored less than 70% was considered as having poor knowledge towards the COVID-19 vaccine [26].

Attitude mean it's a settled way of thinking or point of view about COVID-19 vaccine, of patient attending hospital was assessed by assigning one point for each correct answer and the attitude level indicated by Likert scale. Those clients who are strongly agree 5 points, agree 4point, Nutral 3 point, disagree 2 strongly disagree got 1 for positive question and vice versa for negative one. The respondent attitude range from1 to 25 with cutoff point greater than equal $\geq 44\%$ (11–25) were considered as favorable attitude while less < 40% were taken as unfavorable attitude toward COVID-19 vaccine [26].

Data Quality control

To ensure data quality pre-test was conducted among 5% of the sample size in Yabello General Hospital to ensure the validation of the tool. Hence, amendment was done based on the feedback of the pre-test before the commencement of the final data collection. Two days training was given for the data collectors and supervisors on the aim of the study, clarity of the measuring tool, and ethical considerations. The quality of data was monitored frequently in the field through close supervision of data collectors. All completed questionnaire was checked for their completeness, accuracy and consistency by supervisor and investigator before leaving the health facility. The reliability of variables such as knowledge (Cronbach's $\alpha = 0.792$), attitude (Cronbach's $\alpha = 0.782$) and adherence to mitigation measure (Cronbach's $\alpha = 0.791$) acceptance toward COVID-19 was determined using Cronbach's alpha coefficient.

Data Processing and Analysis

The coded data were entered in to epidata software version 3.1 and it was exported to SPSS version 25 for further analysis. Descriptive statistics were computed to describe sample population characteristics relevant to the variables. Logistic regression was fitted to identify factors associated with willingness to accept COVID-19 vaccine. The analysis was conducted to select candidate variables for the multivariable model. Those variables that show association with willingness at a p-value less than 0.25 was included in multivariable logistic regression model. Both crude and adjusted odds ratios with their corresponding 95% confidence interval were used to determine the strength of association. Multicollinearity was checked by using VIF to see correlation between independent variables, the result showed that no variables with VIF > 10 was observed. The model goodness of fit was tested by the Hosmer and Lemeshow statistical test, the model was considered a good fit since it was found to be non-significant for Hosmer and Lemeshow (P = 0.651). Statistical significance was declared at p-value < 0.05.

Results

Socio-demographic characteristics

This study included 385 participants, with a 100% response rate. There were 207 (53.8%) females and 215 (55.8%) married among them. Two hundred fifty (63%) of the participants are between the ages of 18 and 35, with a median age of 30 years. Hundred twenty-nine (33.5%) and 129(33.5%) of the respondent were completed secondary education and above respectively. The majority of participants, 267 (69.4%), lived in urban areas; 309 (80.3%) were Oromo by ethnicity; 33.8% worked for the government; and 229 (59.5%) had monthly incomes of at least 4,000 Ethiopian Birr (ETB) (Table 1).

Characteristics	Frequency	Percentage
Sex		
Male	178	46.2
Female	207	53.8
Religion		
Orthodox	91	23.6
Protestant	88	22.9
Muslim	181	47.0
Wakefata	25	6.5
Marital status		
Single	97	25.2
Married	215	55.8
Widowed	38	9.9
Divorced	35	9.1
Educational status		
unable to read and write	69	17.9
primary education	58	15.1

Characteristics	Frequency	Percentage
Sex		
secondary education	129	33.5
college and above	129	33.5
Residence		
Urban	267	69.4
Rural	118	30.6
Occupation		
House wife	68	17.7
Farmer	32	8.3
Merchant	115	29.8
Government employee	130	33.8
Non-government	31	8.1
Unemployed	9	2.3
Age		
18–25 years	125	32.5
26–35 years	125	32.5
36–45 years	80	20.8
> 45 years	55	14.3
Monthly income		
< 1999 ETB	87	22.6
2000–3999 ETB	69	17.9
>=4000 ETB	229	59.5
ETB: Ethiopian Birr		

Table 1: Socio demographic Characteristics of the Study Participants at Bule Hora University Teaching Hospital, 2022.

Knowledge towards COVID-19 vaccine

Of the 385 study participants, 86 (22.3%) were still of the view that COVID-19 does not exist in Ethiopia. The majority of participants 281 (73%) knew that anyone can be diagnosed with COVID-19 disease and that the disease can be prevented by vaccination but 295 (76.6%) of them were unaware that the vaccine must be administered twice during a 28-day period. In total, 179 (46.5%) of the participants were well-informed about the COVID-19 vaccination. (Table 2).

Characteristics	Frequency	Percentage
COVID-19 existence in Ethiopia		
Yes	299	77.7
No	86	22.3
Know any one diagnosed with COVID-19 disease		
Yes	104	27
No	281	73
COVID-19 prevented by vaccine		

Characteristics	Frequency	Percentage
Yes	261	67.8
No	124	32.2
Have information about effectiveness of COVID-19 vaccine	152	29.8
Yes	208	54
No	177	46
COVID-19 vaccine is provided free	378	74.1
Yes	294	76.4
No	91	23.6
COVID-19 vaccine is given at 28 days interval		
Yes	90	23.4
No	295	76.6
Health professional, chronic patient and elders given first		
Yes	214	55.6
No	171	44.4
Knowledge status		
Good	179	46.5
Poor	206	53.5

Table 2: Knowledge of the Clients about COVID-19 vaccine at Bule Hora University teaching hospital 2022.

Attitude towards COVID-19 vaccine

The majority of respondents, 190 (49.4%), disagree that COVID-19 is a minor disease that does not necessitate vaccination. Yet, 122 (31.7%) of the participants strongly believe that taking additional precautionary measures is far superior to receiving the COVID-19 vaccine. On the other hand, 60(15.6%) of participants strongly agree that the negative effects of the COVID-19 vaccine outweigh the vaccination benefit, and 43(11.2%) of respondents strongly agree that being infected with COVID-19 disease is preferable to receiving the vaccine. Overall, 272 (70.6%) of respondents were positive with the COVID-19 vaccination. (Table 3).

Characteristics	Frequency	Percentage
I will not take covid19 vaccine until it become composer by law		
strongly disagree	95	24.7
Disagree	188	48.8
Neutral	9	2.3
agree	9	2.3
strongly agree	84	21.8
Taking other protective measure is much better than taking COVID-19 vaccine		
strongly disagree	66	17.1
Disagree	167	43.4
Neutral	11	2.9
Agree	19	4.9

Characteristics	Frequency	Percentage
I will not take covid19 vaccine until it become composer by law		
strongly agree	122	31.7
COVID-19 is not such serious disease that it does not requires vaccine		
strongly disagree	104	27.0
Disagree	190	49.4
Neutral	18	4.7
Agree	13	3.4
strongly agree	60	15.6
I believe that the side effect of COVID-19 vaccine out weight it advantages		
strongly disagree	121	31.4
Disagree	184	47.8
Neutral	12	3.1
Agree	8	2.1
strongly agree	60	15.6
It's better to be infected by COVID-19 than taking the vaccine		
strongly disagree	169	43.9
Disagree	165	42.9
Neutral	5	1.3
Agree	3	0.8
strongly agree	43	11.2
Attitude status		
favorable attitude	272	70.6
unfavorable attitude	113	29.4

Table 3: Attitude about Willingness to Accept COVID-19 Vaccine among Adult Client Attending Bule Hora University Teaching Hospital 2022.

Adherence to Mitigation Measures of COVID-19

Of 385 participants, 62.6% did not stay at home when they experienced flu-like symptoms. The majority of participants, 289 (75.1%), covered their mouth during sneezing or coughing. When they arrive for service, approximately 68.6% of respondents wear a face mask. Overall, 215 (55.8%) of the Client adhered to the COVID-19 mitigation measures (Table 4).

Characteristics	Frequency	Percentage
keep physical distance of 2 meter and above when crowded		
Yes	230	59.7
No	155	40.3
use face mask		
Yes	264	68.6
No	121	31.4

Characteristics	Frequency	Percentage
keep physical distance of 2 meter and above when crowded		
Cover your mouth during cough or sneezing		
Yes	289	75.1
No	96	24.9
Wash hand		
Yes	326	84.7
No	59	15.3
Stay home when you feel flu like symptoms		
Yes	144	37.4
No	241	62.6
Adherence status		
Good adherence	215	55.8
Poor adherence	170	44.5

Table 4: Adherence to Mitigation Measure of COVID-19 to ward willingness to accept COVID-19 vaccine among adult client attending out patient service at Bule Hora University teaching hospital 2022.

Willingness to accept COVID-19 vaccine

According to the findings of this study, nearly 260(67.5%) (95%Cl: 63–72) of the participants were willing to accept COVID-19 vaccine if it was provided for free (Figure 1).
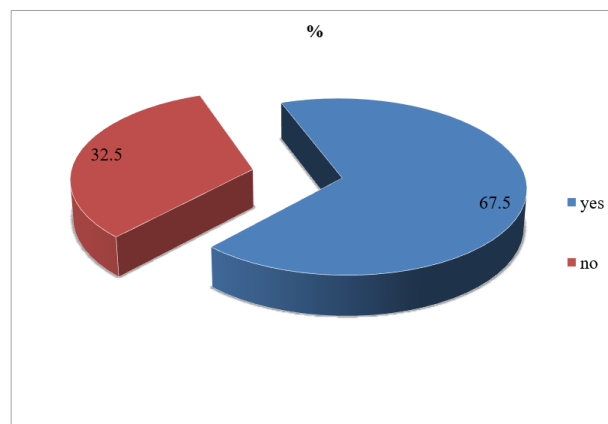
Figure 1: Willingness to Accept COVID-19 Vaccine among Adult Client Attending Out Patient Service at Bule Hora University Teaching Hospital West Guji Zone, 2022.

Factors associated with willingness to accept COVID-19 vaccine

Bivariable analysis was performed using odds ratio at 95% confidence interval and Variable with P- value of < 0.25 in bivariable analysis were considered as candidate for multivariable logistics regression. The result of bivariable logistic analysis shows Residence, age, occupation, client with chronic illness, knowledge, attitude and adherence were factors associated with willingness to accept COVID-19 vaccine. In multivariable analysis occupation, client with chronic illness, knowledge, attitude and adherence to mitigation measure of the respondent were remain associated with willingness to accept COVID-19 vaccine. Government employee were 2-fold more likely willing to accept COVID-19 vaccine compared to (AOR = 2.35; 95% Cl; 1.1-5.0) their counterparts.

Client with history of chronic diseases were 2.59 times more likely willing to accept COVID-19 vaccine (AOR = 2.59:95%; Cl: 1.4–4.78) compared to none chronic illness.

Those Clients with good knowledge were 2 times more likely willing to accept COVID-19 vaccine (AOR = 2.07; 95%Cl: 1.17–3.64) than those with poor knowledge. Client with favorable attitude towards COVID-19 vaccine were 14 times more likely to accept vaccine (AOR = 14.15; 95% Cl: 5.25–37.46) compared to Client with unfavorable attitude. Those clients with good adherence were 1.74 times more likely to accept COVID-19 vaccine with (AOR = 1.74; 95%; Cl: 1.023–2.97) when compared to those with poor adherence (Table-5)

variable	categories	willingness to accept covid-19 vaccine		COR (95% CI)	AOR (95% CI)	p-value
		Yes	NO			
		N (%)	N (%)			
Residence	Urban	188(70.4)	79(29.5)	1	1	
	Rural	72(61)	46(38.9)	0.66(0.42–1.04)	0.9(0.47–1.72)	0.75
Age	18–25 years	79(63.2)	46(36.8)	1	1	
	26–35 years	80(64)	45(36)	1.04(0.62–1.73)	0.79(0.42–1.51)	0.485
	36–45 years	58(72.5)	22(27.5)	1.54(0.83–2.83)	1.06(0.48–2.36)	0.874
	> 45 years	43(78.2)	12(21.8)	2.09(1-4.36)	1.85(0.70–4.87)	0.212
Occupation	House wife	41(60.3)	27(39.7)	1	1	
	Farmer	14(43.7)	18(56.3)	0.51(0.22–1.19)	0.37(0.123–1.11)	0.076
	Merchant	70(59.3)	48(40.7)	0.96(0.52–1.77)	0.78(0.37–1.64)	0.51
	Government employee	112(82.4)	24(17.6)	3.1(1.59–5.92)	2.35(1.1-5)	0.027**
	Non-Governmental worker	23(74.2)	8(25.8)	1.89(0.74–4.84)	0.89(0.28–2.8)	0.838
Chorionic disease	No	143(58.1)	103(41.9)	1	1	
	Yes	117(84.2)	22(15.8)	3.83(2.26–6.45)	2.59(1.4–4.78)	0.002**
Knowledge	Poor knowledge	112(54.4)	94(45.6)	1	1	
	Good knowledge	148(82.7)	31(17.3)	4.00(2.49–6.44)	2.07(1.17–3.64)	0.012**
Attitude	unfavorable attitude	108(95.6)	5(4.4)	1	1	
	favorable attitude	152(55.9)	120(44.1)	0.06(0.023–0.148)	14.15(5.25–37.46)	0.0001**
Adherence	poor adherence	104(61.2)	66(38.8)	1	1	
	good adherence	156(72.6)	59(27.4)	1.68(1.09–2.58)	1.74(1.02–2.97)	0.041**
(**Note**: AOR: adjusted odds ratio; COR: crude odds ratio; CI: confidence interval *p-value < 0.05						
**p-value < 0.01, ***p-value < 0.001)						

Table 5: Bivariable and multivariable analysis to identify factors associated with willingness to accept COVID-19 vaccine among adult client attending out patient service at bule hora University teaching hospital 2022.

Discussion

COVID-19 vaccine is the best strategy for preventing the spread of COVID-19 worldwide, and willingness to receive the COVID-19 vaccine has a significant impact on COVID-19 mitigation. The magnitude of willingness to accept COVID-19 vaccine among adult Client who attend bule hora teaching hospital was 67.5% (95%Cl: 63–72). Government employee, Client with chronic illness, good knowledge, Favorable attitude and good adherence were significantly associated with willingness to accept COVID-19 vaccine.

This is consistent with cross sectional studies done in Korean (61.8%) [28], in polish (60.3%) [29], in Saudi Arabia (64.7%) [30], 34 African countries (63%) [13], in East Africa (60.2%) [31], in Libya (60.6%) [32], Northeast Ethiopia (64%) [33]and (69.3%) [34], North west Ethiopia (62.04%) [35], South Ethiopia in Gurage (62.9%) [3] and (61%) [25] respectively.

The current study is lower than the studies conducted in china (90.6%) [36], Austria (89.8%) [37], United Kingdom (71%) [10] and Israeli (74%) [11] respectively. The difference might be due to community awareness level, burden of diseases, and variation in availability of vaccine type, and socio demographic characteristic. Moreover, the variation could be explained by differences in awareness on the severity of COVID-19, access to health care service. However, it is higher than study in Tunisian (35%) [38] and in Ethiopia (36.02%) [39] respectively. The difference might be difference in a sample size used, in Tunisian smaller than current study,in Ethiopia used larger sample size and hearing rumor that COVID-19 vaccine might have side effect or might cause the virus itself [39].

In this study, government employers were 2.35 times more likely willing to accept COVID-19 vaccine. This is consistent with study conducted in Gonder city North West Ethiopia [40] and E- Survey conducted in Ethiopia [41]. This could be the fact that, government employed individuals might have enough information and knowledge compared to other population. Client with history of chronic disease were 2.59 times more likely to accept COVID-19 vaccine compared to those with no history of chronic disease. This finding is in line with the study conducted in Wolaita Sodo town [27], in Gurage Zone [3], systemic review and meta-analysis Ethiopia [42]. The possible reasons could be health education, burden of disease and first priority was given for individual with chronic disease to be vaccinated first.

In this study, clients with good knowledge were 2 times more likely willing to accept COVID-19 vaccine than those with poor knowledge. This is consistent with systematic review and meta-analysis in East Africa [31], in Ethiopia [42], North East Ethiopia [26], southern Ethiopia among adult population [3] and southern Ethiopia on lactating mothers [25]. The possible explanation could be those who had awareness of the vaccine might know the benefit of being Vaccinated such as halting the transmission of new COVID-19 infections and preventing the Possibility of further morbidity and mortality caused by infections.

Client with favorable attitude towards COVID-19 vaccine were 14-fold more likely to accept vaccine compared to Client with unfavorable attitude. This is consistent with systemic review and meta-analysis in East Africa [31], Systemic review and meta-analysis Ethiopia [43], Northeast Ethiopia [44], Northwest Ethiopia [45]. The possible explanation might be having a positive attitude towards vaccination and its potential for prevention of further complications associated with COVID-19 might make people show a willingness to receive the available COVID-19 vaccine.

In this study, those clients with good adherence were 1.74 times more likely to accept COVID-19 vaccine when compared to with poor adherence. This finding was in line with systemic review and meta-analysis Ethiopia, in Gonder city residence northwest Ethiopia [46], South Ethiopia among lactating mothers [25], Northeast Ethiopia [44]. This could be due to individuals who had good practice knowing the burden of COVID-19 infection on the health of the general population.

Strengths and Limitations

This study focuses on COVID-19 vaccine acceptability and associated factors, which will be useful for decision makers, policy designers, implementers, and managers of health care organizations at all levels to enhance vaccination uptake.

The following are the study's limitations. Since only Johnson & Johnson and AstraZeneca provided the COVID-19 vaccine at the study site, the age limit has been set at 18 years and up. But, when data collecting was completed, other vaccines, such as Pfizer, were administered to clients aged 12 and up. It would be preferable if clients aged 12 and up were included in the research. Furthermore, due to the nature of the study methodology, causal inference may not be inferred from this study.

Conclusion

The willingness to receive the COVID-19 vaccination was 67.5%. Knowledge, a favorable attitude, a history of chronic illness, government employers, and adherence to mitigation measures were all associated with a willingness to accept the COVID-19 vaccine. Participants with a history of chronic disease, a government employer, good knowledge, a favorable attitude, and good adherence to mitigation measures had a higher likelihood of accepting the COVID-19 vaccine.

Health education should be expanded through the Bule Hora teaching hospital's mini media. Community education and health promotion regarding the COVID-19 vaccine should be provided. Advocacy and social mobilization should be undertaken to raise community understanding, attitude, and perception of the COVID-19 vaccine.

It is suggested that further community-based qualitative research on COVID-19 vaccination acceptance be conducted.

Abbreviations

ANC- Antenatal Care

AOR- Adjusted Odds Ratio

ART- Anti-Retroviral Therapy

CI- Confidence Interval

COR- Crude Odds Ratio

COVAX- Coronaviruses Disease Vaccine Global Access

COVID-19- Coronaviruses Disease 2019

ETB- Ethiopia Birr

HIV- Human Immunodeficiency Virus

IESO- Integrated Emergency Surgery and Obstetric

MCH- Maternal and Child Health

MOH- Ministry of Health

OPD- Out Patient Department

PMTCT- Prevention of Mother to Child Transmission

SARS- COV-2 Severe Acute Respiratory Syndrome Cov-2

SPSS- Statistical Package for Social Sciences

WHO- World Health Organization.

Declarations

Acknowledgments

Availability of data and materials

All necessary information were included within the manuscript.

Ethics approval and consent to participate

Ethical clearance was obtained from Bule Hora university research and publication directorate. After the purpose of the study was explained to participants, informed consent with a written signature was obtained. They were informed to withdraw at any time and or to refrain from

responding questions. Study participants were also informed that all data obtained from them could be kept confidential using code instead of any personal identifiers. Furthermore, the research procedure was conducted in accordance with the principle expressed in the World Medical Association's Declaration of Helsinki.

Competing interest

The authors declare that they have no competing interests.

Consent for publication

Not applicable

Authors' contributions

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