

Research Article

COVID-19 Vaccine Acceptance and Associated Factors in Gilgel Beles Town, Metekel Zone, Benishangul-Gumuz Region, Northwest Ethiopia

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Abstract

Background: The coronavirus killed millions of people globally and was deemed a public health emergency on March 11, 2020. Many nations have put strict regulations in place. Mass vaccinations to protect the public from COVID-19 have been in place since December 2020. To stop viruses from spreading, community immunizations against COVID-19 are crucial. However, there is currently no information available on Gilgel Beles town's community's adoption of the COVID-19 vaccination. **Objective:** The objective of this study is to assess the level of acceptance of COVID-19 vaccination and its associated factors among communities in Gilgel Beles town, Metekel zone, North West Ethiopia. **Methodology:** Community-based cross-sectional study was employed between April 20/2022, and May 20/ 2022, in Gilgel Beles town. A systematic random sampling technique was used to choose 418 households in the town. After obtaining the ethical clearance sheet, Data was gathered through face-to-face interviews at their home. Before being moved to SPSS version 22 for analysis, the data were coded, cleaned, recorded, and entered into Epidata 4. The relationship between independent and dependent variables was investigated using bivariate logistic regression analysis. A variable in the multiple logistic regression models with a p-value ≤ 0.05 was considered statistically significant. **Results:** Of 415 respondents, above half of them, 255 (61.4%), were accepted to take the COVID-19 vaccine if available. Age (P-value=0.000), History of vaccine adverse effects (AOR=3.63, 95% CI: 1.38, 9.55), Cigarette smoking practice (AOR=3.47, 95% CI: 1.45, 8.27), Friends have been diagnosed with COVID-19 (P-value=0.000) and type of media (P=0.016) were significantly associated with acceptance of COVID-19 vaccine. **Conclusion:** The prevalence of COVID-19 vaccination acceptance was not high enough. The engagement of religious organizations and religious leaders to promote the advantages of COVID-19 vaccination to their followers and promotion through community radio should be implemented to increase COVID-19 vaccination acceptance.

Keywords

COVID-19, Vaccine, Acceptance, Gilgel Bless, Ethiopia

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1. Background

The world has been confronted with a new and powerful threat in the form of COVID-19 [1]. Although coronaviruses are not new to the medical sciences, the SARS outbreak, a novel fifth kind of coronavirus, is now being studied for its characteristics and changing epidemiology. The strain of COVID-19 that is now in use is novel and has never been found in a person. Animal-to-human transmission was suggested early on in the Wuhan outbreak when it was revealed that many of the patients had some connection to a sizable seafood and animal market. Person-to-person dissemination, however, was explained by a growing proportion of patients who said they had never been exposed to animal markets [2, 3].

Since its declaration as a public health emergency on March 11, 2020, the coronavirus pandemic has claimed millions of lives globally. To slow the spread of the virus, many nations have imposed strict policies, including face masks, social distancing, and even nationwide lockdowns. To protect the populace from COVID-19, widespread vaccination campaigns have been underway throughout Europe and America since December 2020. The introduction of the Oxford-AstraZeneca viral vector vaccine and the mRNA Pfizer-BioTech vaccine represents the biggest immunization effort in developed nations [4-6].

Ethiopian officials decided to use the COVAX Facility to administer the AstraZeneca COVID-19 vaccine. Ethiopia got 2.2 million doses of the COVID-19 vaccine from COVAX on March 7, one year ago. The COVID-19 vaccination was introduced on March 13, 2021. Over 20.5 million people have received the entire vaccination, and over 21.5 million people have received at least one dose. In order to reach a larger percentage of the population, efforts are being made to boost vaccination uptake [2, 7, 8].

2. Methods

2.1. Study Area and Period

The study will be conducted in Gilgel Beles town between April 20 and May 20/2014. Gilgel Beles town is located in the Metekel zone of Benishangul Gumuz regional state at a distance of 550 km from Addis Ababa and 378 Km from the regional capital, Assosa. Gilgel Beles town was founded in 2000. Its population is estimated 15, 220 in 2013 EFY. From this, 7,786 are female and 7434 are male. There are two administrative Keble and four Ketena in the towns administrative. The health care access in the town is dependent on one public healthcare facility and four private healthcare facilities.

2.2. Study Design

Community-based cross-sectional study design was employed.

2.3. Source Population

All households found in Gilgel Beles town, Metekel zone, North West Ethiopia, were the source population of this study.

2.3.1. Study Population

All randomly selected individuals were the study population of this study.

2.3.2. Inclusion and Exclusion Criteria

Individuals aged ≥ 18 years will be included in this study, and people who are incompetent during the period of data collection and Covid-19 vaccinated individuals were excluded.

2.4. Sample Size Determination

Since there has been prior research conducted on the acceptance COVID-19 vaccine in Ethiopia, the prevalence (P) of acceptance was 45% [9]. With the following considerations in mind, the sample size was calculated using the single population proportion formula with a marginal error of 0.05, a 95% confidence interval, and a p-value of 0.5. Assume a 10% non-response rate.

2.5. Sampling Technique and Procedure

The respondents were taken from the sampled households. A systematic random sampling technique was used to choose households in the town; the first household will be selected using a simple random sampling technique, and then others will be selected at every 8th interval until the required sample size is reached. If there was more than one individual who fulfilled the inclusion criteria in one household, one respondent was selected with a simple random sampling technique.

2.6. Data Collection Tool and Procedure

A structured questionnaire was used to capture quantitative data. The questionnaire has five parts: 1) Socio-Demographic Characteristics, 2) Health condition, 3) COVID-19 experience, 4) COVID-19 vaccine acceptance, and 5) Use of broadcast media. Questions were adapted from previously published studies [10, 11]. After providing consent to the participants, Face to face interview was administered to the randomly selected respondents with a structured questionnaire.

2.7. Data Processing and Analysis

Before being moved to SPSS window version 22 for analysis, the data were coded, cleaned, recorded, and entered into Epidata version 4. A table, figure, and statement were used to present the data. The relationship between independent and

dependent variables was investigated using bivariate logistic regression analysis. To control for possible confounding, all variables in the bivariate logistic regression model with a p-value <0.25 were added to the multivariable logistic regression model, and variables in the multiple logistic regression model with a p-value ≤ 0.05 will be considered statistically significant.

2.8. Data Quality Control

To ensure the quality of data, the data collection tool was reviewed by the expertise group, and one day of training for data collectors was given before the beginning of the actual data collection day. All filled questionnaires were checked immediately after each session of data collection by the supervisors daily for completeness. Before analyzing the data was cleaned thoroughly to check for completeness, and data was entered with the help of Epi-info to minimize error during entry.

2.9. Variables

2.9.1. Dependent Variable

Acceptance of the COVID-19 vaccine.

2.9.2. Independent Variable

1. Sociodemographic variables;
2. Health condition;
3. Experience of Covid-19;
4. Use of Media.

2.10. Operational Definition

COVID-19 vaccine acceptance is defined as the willingness to take the vaccine. Accordingly, the participants will be asked about their willingness to accept the vaccine; the possible answers will be “Yes” or “No.” A score of “1” was given for Yes, and a score of “0” was given for No [12, 13].

3. Results and Discussion

3.1. Socio-Demographic Characteristics

415 respondents participated in this study with a 99.2% response rate. A majority, 206 (49.6%) of respondents were found in the 18-29 age category, and 224 (54%) of the respondents were females. Above half of the respondents, 260 (69.9%) of respondents were married. One-third of the respondents' educational status, 129 (31.1%), in the study were college and above (Table 1, p-18, 19).

Table 1: Socio-demographic characteristics of the respondent in Gilgel Beles town, Metekel zone, Benishangul-Gumuz regional state, 2022 (p-18-19).

Table 1. Sociodemographic characteristics of the respondent in Gilgel Beles town, Metekel zone, Benishangul-Gumuz regional state, 2022 (P-11).

Socio-demographic characteristics of the respondent	Frequency	Percent
Age		
18-29	206	49.6
30-49	147	35.5
>49	62	14.9
Sex		
Male	191	46.0
Female	224	54.0
Religion		
Orthodox	256	61.7
Muslim	92	22.2
Protestant	56	13.5
Catholic	11	2.7
Marital status		
Single	125	30.1
Married	290	69.9
Educational status		
Unable to read and write	96	23.1
Able to read and write	64	15.4
Primary education	51	12.3
Secondary school	75	18.1
College and above	129	31.1
Occupation		
Student	85	20.5
Employee	70	16.9
Unemployed	44	10.6
Homemaker	94	22.7
Informal job	113	27.2
Healthcare worker	9	2.2

3.2. Current Health Status and Vaccination History of Respondents

The majority of the respondents, 401 (96.6%), had felt healthy during the time of the interview. Only 34 (8.2%) of the respondents had a history of previous vaccine rejection. The history of Previous Vaccine adverse effects is reported by only 24 (5.8%) of the respondents. About one in eight respondents had a chronic illness unfollow-up during the time of data

collection. The majority of the respondents, 335 (80.9%), were vaccinated during childhood. Cigarette smoking practice was reported by about one-third of the respondents, 29 (7%) (Table 2, P-20).

Table 2. Current health condition and vaccination history of the respondent in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (P-12).

Health condition and vaccination history of the respondent	Frequency	Percentage
Overall health status		
Healthy	401	96.6
Not healthy	14	3.4
History of previous vaccine rejection		
Yes	34	8.2
No	381	91.8
History of Vaccine severe adverse effects		
Yes	24	5.8
No	391	94.2
Chronic illness		
Yes	62	14.9
No	353	85.1
Vaccination during childhood		
Yes	335	80.9
No	80	19.1
Cigarette Smoking		
Yes	29	7.0
No	386	93.0

Table 2 Current health condition and vaccination history of the respondent in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (P-20).

3.3. Participants' Experience of COVID-19 Infection

The majority of the respondents, 403 (97.1%), had no contact history with COVID-19 patients. Only a few of the respondents, 47 (11.3%), had undergone a COVID-19 test. A positive result was reported by the majority of the respondents who had undergone a COVID-19 test (Table 3, P-20).

Table 3. Respondent's experience with COVID-19 infection in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (P-12).

Respondent's experience with COVID-19 infection	Frequency (N=415)	Percentage (%)
Contact history with a COVID-19 patient		
Yes	12	2.9
No	403	97.1
Households have been diagnosed with COVID-19		
Yes	45	10.8
No	370	89.2
Relatives have been diagnosed with COVID-19		
Yes	46	11.1
No	369	88.9
Friends have been diagnosed with COVID-19		
Yes	65	15.7
No	350	84.3
Have tested for COVID-19		
Yes	47	11.3
No	368	88.7
COVID-19 test result (N=47)		
Positive	39	82.9
Negative	8	17.1
Heard about the COVID-19 vaccine		
Yes	392	94.5
No	23	5.5

Table 3 Respondent's experience with COVID-19 infection in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (P-20).

3.4. Acceptance of the COVID-19 Vaccine

Above half of the respondents, 255 (61.4%), were accepted to take the COVID-19 vaccine if available. While 160 (38.6%) of the respondents were not accepted to take the COVID-19 vaccine if available (Figure 1, P-18).

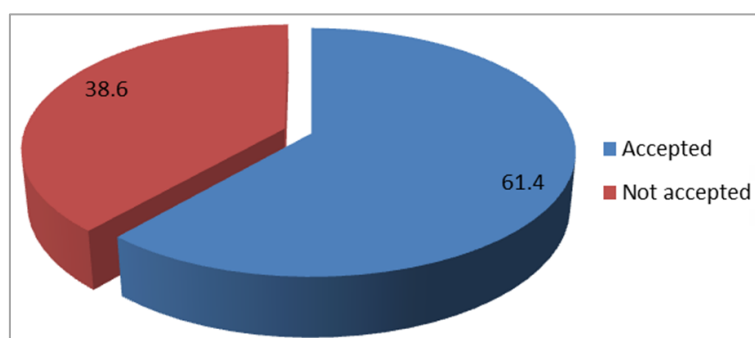


Figure 1. Acceptance of COVID-19 vaccine in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (P-12).

Figure 1: Acceptance of the COVID-19 vaccine in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (P-18).

3.5. Reasons for Non-Acceptance of COVID-19 Vaccines

Of 162 respondents, 44 (27.3%) and 42 (26.1%) of the respondents were concerned about to fear of adverse effects of the vaccine and Unreliable due to religious reasons as the main reason for non-willingness to take the COVID-19 vaccine, respectively (Table 4, P-21).

Table 4. Reasons for Non-Acceptance of COVID-19 Vaccines among Respondents in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (N=415) (P-13).

Reasons for not taking the COVID-19 vaccine	Frequency (N=161)	Percentage
Inadequate data about the safety of the vaccine	27	16.8
Fear of the adverse effects of the vaccine	44	27.3
A concern about the vaccine being ineffective	1	.6
The vaccine causing COVID-19	2	1.2
Prefer other ways of protection	10	6.2
Prior adverse reaction to any vaccine	27	16.8
Unreliable, due to short time for development	8	5
Unreliable, due to religious reasons	42	26.1

Table 4: Reasons for Non-Acceptance of COVID-19 Vaccines among Respondents in Gilgel Beles town, Metekel zone, Benishangul-Gumuz regional state, 2022 (N=415) (P-21).

3.6. Factors Associated with Acceptance of COVID-19 Vaccines

Age, history of vaccine adverse effects, Cigarette smoking, friends who have been diagnosed with COVID-19, and use of media were all found to be significantly correlated with acceptance of the COVID-19 vaccines in a multivariable logistic

regression. COVID-19 vaccines were more likely to be accepted by those who have no history of vaccine adverse effects (AOR=.3.63, 95% CI: 1.38, 9.55). Another factor linked to COVID-19 vaccine acceptance was one's Cigarette smoking practice. Those who practice cigarette smoking were three times more likely than those with do not practice cigarette smoking to accept the COVID-19 vaccine (AOR=3.47, 95% CI: 1.45, 8.27) (Table 5, P-21, 22).

Table 5 Factors Associated with Acceptance of COVID-19 Vaccine in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (N=415) (P-21, 22).

Table 5. Factors Associated with Acceptance of COVID-19 Vaccine in Gilgel Beles town, Metekel zone, Benishangul Gumuz regional state, 2022 (N=415) (p-13).

Variable	Category	Frequency (%)	COR with 95% CI	AOR with 95% CI	P-value
Age	18-29	206 (49.6%)	4.99 (2.71, 9.19)	0.68 (0.41, 1.13)	0.135
	30-49	147 (35.4%)	3.31 (1.77, 6.21)	0.2 (0.09, 0.43)	0.000*
	>49	62 (14.9%)	1	1	
History of vaccine adverse effects	No	391 (94.2%)	0.21 (0.10, 0.44)	3.63 (1.38, 9.55)	0.000*
	Yes	24 (5.8%)	1	1	
Cigarette smoking	No	386 (93%)	1	1	
	Yes	29 (7%)	2.81 (1.29, 6.12)	3.47 (1.45, 8.27)	0.005*
Friends have been diagnosed with COVID-19	No	350 (84.3%)	1	1	
	Yes	75 (15.7%)	0.21 (0.10, 0.44)	0.19 (0.08, 0.43)	0.000*
Type of media	Television	242 (58.3%)	0.28 (0.13, 0.58)	0.63 (0.28, 1.43)	0.273
	Radio	37 (8.9%)	0.72 (0.44, 1.17)	0.51 (0.30, 0.88)	0.016*
	Social media	99 (23.9%)	0.36 (0.18, 0.72)	0.56 (0.26, 1.20)	0.136
	Magazine	37 (8.9%)	1	1	

4. Discussion

In Ethiopia, COVID-19 vaccines have been launched as “the perfect cure” for bringing the current pandemic to an end. Following the publication of multiple clinical trials with encouraging findings, several nations have approved the use of particular vaccinations in immunization programs [14]. The purpose of this study was to ascertain the respondents' estimates of COVID-19 vaccination acceptability and related parameters in Gilgel Beles, Metekel zone. This study indicated that 61.4% of people accepted the COVID-19 vaccination.

According to the current study's findings, 189 participants (45.5%) said they would be willing to accept COVID-19 vaccines if they were accessible, whereas 226 participants (54.5%) said they would not accept them if they were [15]. The acceptability of the COVID-19 vaccine was higher in this study than in other countries, with 36.8% in Jordan [16], 37.2% in Hong Kong [16], and 34.9% among Jordanian university students [17]. Time or sociodemographic variables could be the likely cause of the divergence between the current outcome and other studies..

The results of this study were better than those of prior global investigations. West Indians' knowledge, attitudes, and behaviors about the acceptance of the COVID-19 vaccine (64.5%) [18]. On the other hand, the finding of this study was lower than the study conducted on public acceptance of COVID-19 in China (83.3–91.3) [19]. The

COVID-19 vaccine was accepted by 79% of the people in Israel [20]. Global survey of potential acceptance of a COVID-19 vaccine with 71.5% [21]. 63.5% of respondents in the United Kingdom are willing to accept the COVID-19 vaccine if available [22].

The study's findings indicate that people without a history of vaccination side effects were more likely to adopt the COVID-19 vaccine if it became available than people with a history of side effects. If the COVID-19 vaccination were made available, participants who smoke cigarettes were more likely to receive it than those who do not. One explanation could be that people who smoke are aware of the possibility of contracting COVID-19. The acceptance of the COVID-19 vaccine was higher among those with media access than among those without. Most of the time, the COVID-19 vaccine was promoted through the media; those who were informed about the vaccine had a better chance of accepting it. Another significant factor was age. The age group between 30 and 49 was more willing to accept the COVID-19 vaccine than other age groups.

According to the results of these investigations, participants' main reasons for refusing to accept the COVID-19 vaccine were their fear of negative side effects and their lack of trustworthiness. The results are consistent with those of other research on fear of adverse effects [5, 11, 23, 24]. For instance, according to a Ghanaian investigation, the main reasons why people refused to receive COVID-19 vaccinations were a lack of information regarding the vaccine's safety and adverse effects. [25].

5. Conclusion

The findings of this study suggest that the acceptance of a COVID-19 vaccine was good compared to the findings of other studies. Acceptance of the COVID-19 vaccine was significantly correlated with age, use of mass media, history of vaccine adverse effects, friends diagnosed with COVID-19, and cigarette smoking.

6. Recommendation

To the Metekel zone health desk, Communication strategies of the vaccination campaigns should provide clear, simple and detailed messages about the efficacy and the benefits of the COVID-19 vaccines. Engagement of religious organizations and religious leaders to promote the necessary COVID-19 vaccination to their followers.

To Benishangul Gumuz regional health Bearu, with different stakeholders, should strengthen public education using Community radio, about the advantages of getting COVID-19 vaccination, and to access the individuals who are willing to take the vaccine, if available.

7. Limitation

This study is that it is cross-sectional, making it difficult to draw long-term conclusions. The results of this research were solely based on quantitative techniques, with no qualitative data being used to supplement the findings.

Abbreviations

COVID-19	Coronavirus Disease 2019
CCO	Chief Clinical Officer
CEO	Chief Executive Officer
EC	Ethiopian Calendar
HCPs	Health Care Providers
JCVI	Joint Committee on Vaccination
SARS	Severe Acute Respiratory Syndrome

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Author Contributions

Dereje Getahun Gashaye: Conceptualization, Formal analysis, writing –Original draft, Investigation Methodology
Tamiru Bogale Jemberu: writing, Original draft, Inves-

tigation Methodology

Solomon Debela Bekeko: Writing – review & editing, Software

Biratu Ebessa Sedeta: Investigation Methodology

Declaration

I hereby declare that the information given above and in the enclosed document is true to the best of my knowledge and belief, and nothing has been concealed therein. I understand that if the information given by me is proven to be untrue. I will have to face the punishment as per the law.

Availability of Data and Materials

The source of the data is present at the corresponding author upon reasonable request by concerned individuals.

Ethics Approval and Consent

For this research, Ethical clearance was obtained from the Ethical Committee Review Committee of PHSC in Ethiopia. After a formal letter was written to the study area, data collection was started, and verbal consent was obtained from participants.

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Conflicts of Interest

The authors declare no conflicts of interest.

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