

# Level of Community Readiness for the Prevention of COVID-19 Pandemic and Associated Factors Among Residents of Awi Zone, Ethiopia: A Community-Based Cross-Sectional Study

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**Background:** Novel coronavirus 19 is a contagious disease that affects all most all countries of the world and puts the world in great challenge. Even though, there is a limited testing capacity in Africa the number of cases and deaths is progressively increased. This catastrophic case has a great impact in Africa unless preventive measures are effectively undertaken. In Ethiopia, the number of COVID-19 cases and death are increasing over time. Therefore, this study was aimed to assess the level of community readiness for COVID-19 pandemic prevention and its associated factors in residents of Awi Zone, Northwest Ethiopia.

**Methods:** A community-based cross-sectional study design was conducted among 1524 study participants from July 28 to August 27, 2020. Data were collected using structured and pre-tested interviewer-administered questionnaires. The collected data were entered into EPI data 4.6 versions and analyzed using Statistical Package for Social Science (SPSS) version 24.0. Those variables with P-value<0.25 were entered into multivariable analyses and those variables with P-value < 0.05 were considered statistically significant. Finally, the findings of the result were explained using texts, figures, and tables.

**Results:** A total of 1423 participants have participated in the study. The finding revealed that the prevalence of knowledge, attitude, perception, and practice towards COVID-19 were found to be 76.6%, 68.4%, 68.5%, and 29% respectively. In final model, being a female [AOR=1.388 (95% CI: 1.050–1.834) P= 0.021], married respondents [AOR=3.116 (95% CI: 1.592–6.099) P= 0.001], Muslim religion followers [AOR=2.392 (95% CI:1.503–3.806) P=0.002], and able to read and write [AOR=1.986 (95% CI:1.311–3.006) P=0.002] were some of the variables significantly associated with the level of community readiness towards COVID-19 preventive measures.

**Conclusion:** The study findings indicate that respondent's level of community readiness for COVID-19 prevention was mainly affected by sex, marital status, religion, and educational status. The Health education programs aimed at mobilizing and improving COVID-19 related level of community readiness especially practice are urgently needed. Awareness creation programs on more targeted groups such as men, unmarried and those with low educational level and religious leaders should be teaching the believers by interacting with faith and science on the means of preventing the pandemic.

**Keywords:** COVID-19, knowledge, attitude, readiness, practice, perception, Ethiopia

## Introduction

Mankind has observed and fighting an invisible enemy of several pandemics through history where some of which were more disastrous to humans.<sup>1</sup> In

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Wuhan, Hubei Province, China, a cluster of pneumonia cases of unknown etiology was reported in December 2019, and China's center of disease control (CDC) reported a novel coronavirus as the causative agent of coronavirus disease 2019 (COVID-19) outbreak on January 2020.<sup>2</sup> World health organization (WHO) also declared COVID-19 as a Public Health Emergency of International Concern (PHEIC) on 31st of January 2020 and declared as a pandemic on 11th March 2020.<sup>3</sup>

The virus has no proven therapeutic drugs and or vaccines, but the only key transmission preventing strategies depends on; educating the public about the nature of the disease and the transmission route, restricting mobility within and across borders, physical distancing, hand washing, environmental cleaning, and the rational use of personnel protective equipment (PPE) like masks.<sup>4,5</sup> However, strict mass social distancing and lockdown may be difficult in countries of low-and-middle-income countries (LMIC) with foregoing unstable economic ground level, where most of the population leads their life from daily based income.<sup>6,7</sup> In the context of developing countries unless the concerned bodies like governments, institutions, or wealthy individuals address the impacts of strict lockdown and travel ban for the most vulnerable communities, household food insecurity and related morbidity and mortality might be much higher than COVID-19.<sup>8,9</sup>

COVID-19 pandemic affects almost all continents of the world; America and Asian countries were highly affected. In Africa, because of low testing capacity, week contact tracing, and poor reporting system, the number of cases and deaths are low as compared to developed nations.<sup>10</sup> The case-fatality rate (CFR) of the diseases depends on patients' age, substance abuse, and any comorbidity. Even if most COVID-19 cases are mild, ~25% of COVID-19 patients require intensive care and ~10% need mechanical ventilation. Now, the COVID-19 pandemic is the most challenging event for the whole world's features such as the socio-economic, healthcare system, and psychological wellbeing of humanity.<sup>11</sup>

Even though many countries in Africa scale-up their preparation and readiness to tackle the COVID-19 pandemic, shortage of testing kits, poor tracing system, poor health care system, shortage of PPE, shortage of laboratories, and negligence of the public to the preventive measures are the big challenge for the continent.<sup>4,10,12</sup> Continuous increment of the infection, morbidity, lack of therapeutic measures,

increased costs of the PPE, and medications are also major constraints in less developed nations.<sup>13</sup>

Community readiness is crucial to decrease the burden of COVID-19 on socio-economic activities and the health-care system.<sup>14</sup> Knowledge, attitude, perception, and practice for COVID-19 prevention strategies vary from the country.<sup>15–25</sup> WHO recommends that different approaches to the countries to prepare themselves to respond to COVID-19 pandemic. To reduce transmission of COVID-19 and its economic, public, and social impacts; assessing the risk and immediate implementation of appropriate measures are essential.<sup>16</sup>

In Ethiopia, especially in rural communities, residents may notice themselves as low risk of acquiring COVID-19, and compliance with the preventive measures is very poor. During a weekend the communities are mainly gathered for a traditional organization like mahber/senbetie, teskar, ekub, edir, wedding, and religious purpose. Unless immediate measures are taken nationwide, we will cost a lot. Publics' knowledge, perception, attitudes, and practices towards COVID-19 preventive measures are pillars for the overall preparedness, readiness, and response. Therefore, this study was aimed to assess the level of community preparedness and associated factors for COVID-19 preventive measures among communities of the Awi zone.

## Methods and Materials

### Study Setting and Design

A community-based cross-sectional study design was conducted in the Awi zone from July 28 to August 27, 2020. This zone is one of 11 zones of the Amhara Regional State, Northwest Ethiopia. Injibara is the administrative center of the Awi zone and is located 452 km north of Addis Ababa and 129 km South of BahirDar (City of Amhara Region). The zone has 9 districts and three administrative towns. The zone is bordered in the west by Benishangul-Gumuz Region, on the North by West Gondar Zone, and the East by West Gojjam Zone. According to 2007 census data conducted by Central Statistical Agency, this zone had a total population of 1,322,693, of whom 64, 8295 were men and 674,397 were females.<sup>26</sup>

### Populations

All residents in the Awi zone, Northwest Ethiopia were the source population whereas all selected study participants during the study period were the study populations.

## Inclusion and Exclusion Criteria

The head of households whose age is greater than 18 years old and those who reside at least for the last six months in the study area was included in the study whereas, those who were unable to communicate due to critical illness were excluded from the study.

## Sample Size Determination

The separate sample size estimate for each objective was determined using Epi info 7 StatCalc. The largest sample size; which is 1057 was taken.<sup>23</sup> By adding a 1.5 design effect and non-response rate of 10% to the largest sample, the calculated final sample size for the study was 1744. However, one of the study areas which had a sample size of 220 was excluded from the final analysis due to its false report; hence the total last sample size was reduced to 1524.

## Sampling Procedures

All districts and administrative towns of the zone were included in the study. Initially, the calculated sample size was proportionally allocated to each Kebele based on the number of households. Then, each household was selected by using a simple random sampling method based on the allocated proportion.

## Data Collection Tools

A structured interviewer-administered questionnaire was used to collect data. The survey tool and interview guides were developed by reviewing different works of literature, current national and international guidelines on COVID-19 prevention. The tool contains; socio-demographic characteristics, knowledge of residents, and the community perception, attitude of the individuals, and COVID-19 prevention practice-related questions. Twenty-two data collectors and six supervisors were involved in the data collection process.

## Data Collection Techniques

The data were collected from the head of households or from those family members whose age is 18 years old and above in selected households of each kebeles. Before starting data collection, three-day training was given for both the data collectors and supervisors on data collection ways and overall procedures. The data collectors have collected the information by following the current public health and social measures of the COVID-19 pandemic.

Before interviewing the study participants, information was given to data collectors about the aim of the study, purposes, risks and possible benefits, and the right to refuse to participate in the study. Then those participants who sign in the voluntary consent were interviewed.

## Operational Definitions

### Level of Community Readiness for COVID-19 Pandemic Prevention

Communities' level of readiness for COVID-19 pandemic was indicated as ready if the respondents have good knowledge, increase vulnerability perception, positive attitude, and good practice towards prevention measures, and not ready if either one or more of the above-stated sub-categories were reversely responded.

### Knowledge About COVID-19

The respondents' level of knowledge about COVID-19 was reported as good knowledge if the study participant correctly responded to more than or equal to 75% of knowledge assessment tools, and poor for <75%.<sup>19</sup>

### Perception of COVID-19

The respondents' perception about COVID-19 was assessed by 5 points Likert scale, and the highest score above the mean was indicated as increase vulnerability perception and low as poor perception.<sup>21</sup>

### Attitudes Towards COVID-19

The attitude of the participant was categorized as positive or favorable if responded above the mean score of the responses and negative if below the mean score.<sup>20,22</sup>

### The Practice of COVID-19 Prevention Measures

The respondents' level of practice of COVID-19 prevention measures was reported as good practice if the study participant correctly responded to more than or equal to 75% of practice assessment tools, and poor for <75%.<sup>19</sup>

## Data Quality Control

To make sure the quality, the questionnaire was translated into the local language (to Amharic) by experts. Finally, before data collection, it was re-translated back to English to verify consistency. A pre-test was conducted among 3% of the study sample in kebeles out of study setting to verify the appropriateness and feasibility of the tool (for validity and reliability test) and modifications were taken accordingly before actual data collection. Extensive training was given for both data collectors and supervisors. The

tool was used with a reliability test or Cronbach's alpha correlation coefficient of greater than or equal to 0.7 for inter-item consistency. The data collection team was communicated and discussed with principal investigators if they face any challenges during the daily basis data collection period.

## Data Analysis

Descriptive analysis was done by computing proportions and summary statistics. The bivariate analysis was used to see the association between each independent variable and the outcome variables by using binary logistic regressions. The assumption for binary logistic regression was checked. The goodness of fit was tested by the log-likelihood ratio (LR). All variables with  $P < 0.25$  in the bivariate analysis were included in the final model of multivariable analysis to control all possible confounders. A Multi-collinearity test was carried out to see the correlation between independent variables by using collinearity statistics (Variance inflation factor (VIF)  $> 10$  and standard error  $> 2$  was considered as suggestive of the existence of multi co-linearity). The adjusted odds ratio along with 95% CI was estimated to identify factors in the multivariable model. In this study  $P$ -value  $< 0.05$  was deemed to declare statistical significance. Then, the finding was presented by using simple frequencies, summary measures, tables, texts, and figures.

## Results

### Socio-Demographic Characteristics

In this study, a total of 1423 respondents have participated with a response rate of 93.4%. The age of respondents ranges from 18–81 years with a mean and standard deviation (SD) of  $33.83 \pm 11.84$  years respectively. More than half (54.7%) of the study participants were males and 643 (45.2%) were in the age group of 18–29 years. Nine hundred eighty-three (69.1%) were from the Agew ethnic group and 1278 (89.8%) of respondents were orthodox Christian religion followers. Eight hundred six of the study participants (56.6%) were married in marital status. Four hundred forty-five (31.3%) of the study participants had an educational level of college and above and 343 (24.1%) of the participants have been working as government employees (Table 1).

## Source of Information for COVID-19

All (100%) of the study participants had heard about the COVID-19 pandemic. The main source of information for about 54.7% of the study participants were mass media, whereas the remaining were obtained from community/friends and family (41%), 36.4% from health care

**Table 1** Socio-Demographic Characteristics of Participants Towards COVID-19 Pandemic in Awi Zone, Amhara Region, Ethiopia, 2020 (n=1423)

Variables	Category	Frequency	Percent
Age	18–29 years	643	45.2
	30–49 years	617	43.4
	$\geq 50$ years	163	11.5
Sex	Male	778	54.7
	Female	645	45.3
Marital status	Single	490	34.4
	Married	806	56.6
	Divorced and widowed	127	8.9
Residence	Urban	568	39.9
	Rural	855	60.1
Religion	Orthodox Christian	1278	89.8
	Muslim	107	7.5
	Others <sup>a</sup>	38	2.7
Ethnicity	Agew	983	69.1
	Amhara	387	27.2
	Others <sup>aa</sup>	53	3.7
Educational status	No formal education	373	26.2
	Read and write	264	18.6
	Primary	167	11.7
	Secondary	174	12.2
	College and above	445	31.3
Occupation	Farmer	513	36.1
	Merchant	248	17.4
	Student	169	11.9
	Private Employee	68	4.8
	Government Employee	343	24.1
	Others <sup>aaa</sup>	82	5.8
Family size	$< 4$	841	59.1
	4–7	483	33.9
	$> 7$	99	7.0

**Notes:** Others<sup>a</sup>, Protestant & Catholic; Others<sup>aa</sup>, Tigre, Oromia and Shinesha; Others<sup>aaa</sup>, housewife, driver, daily labor.

providers, 5.4% from print media, and 3.4% from others like; phone text, from religious places, and prisons.

## Respondents' Knowledge of COVID-19 Pandemic

This study revealed that the prevalence of good knowledge was found to be 76.6% (95% CI, 74.3–78.7). Nine hundred forty-one (89.4%) of study participants were correctly answered COVID-19 as a viral infection and 66.4% respond to the incubation period of COVID-19 infection is from 2–14 days. Five hundred seventy-two (40.2%) of the study participants mentioned all (fever, cough, sore throat, fatigue, and headache) signs and symptoms of the COVID-19 pandemic. About 27.5% of the study participants did not know that asymptomatic patients can transmit the infection to healthy individuals. Whereas 83.2% of study participants knew elderly patients are at higher risk of being infected with COVID-19. The majority (88.8%) of study participants knew that COVID-19 is transmitted by close contact and respiratory droplets and 87% of study participants knew that wearing masks can prevent infection of COVID-19 (Table 2).

## Respondents' Attitude on COVID-19 Pandemic

The finding of this study showed that about 68.4% (95% CI, 65.9–70.8) of the participants had a positive attitude towards COVID-19 preventive measures. The mean and standard deviation of participants attitude towards COVID-19 was 37.52 and 8.968 respectively. The majority (86.2%) of study participants agreed that early recognition of signs and symptoms of COVID-19 can improve treatment and recovery from COVID-19. More than three-fourth (78.2%) of the study participants believes that asymptomatic patients may infect healthy individuals. Nine hundred seventeen (64.4%) of study participants agreed that COVID-19 will finally be controlled successfully and 85.6% believe that compliance with the ministry of health (MOH) precaution will prevent the spread of disease. Almost all of the study participants believed in the value of handwashing and limited personal contact. Likewise, ~78.6% of the participants believed that having no face mask can increase transmission (Table 3).

## Respondents Perception of COVID-19

The mean and standard deviation of the study participant's perception of COVID-19 was 7.73 and 2.229 respectively.

According to this study, 68.5% (95% CI, 66–71) of study participants had a good perception of COVID-19. About 85.2% and 33.1% of study participants perceived that corona is scary and was designed as a biological weapon respectively (Table 4).

## The Practice of Study Participants Towards COVID-19

About 29% (95% CI; 26.8–31.5) of study participants had a good practice. The majority of study participants have complied with COVID-19 preventive measures; 37.0% did not wash their hands, 43% did not apply physical distancing, only 35.6% avoid public transport, and 62.8% did not use any disinfectant and solutions to prevent infection. Surprisingly nearly three-fourth of the study participants did not use masks. More than three-fourths of the study participants stop shaking hands, hugging, and kissing while they greet others (Table 5).

About 67.6% of participants were involved in large social events like mahiber, edir, equib, tesker, senbetie and religious ceremonies and only 10.4% utilize the mask in the study area (Figures 1 and 2).

## Level of Community Readiness Towards COVID-19 Prevention

About 20.2% (95% CI, 18.1–22.3) of the study participants were well ready on COVID-19 preventive measures (Figure 3).

## Factors Affecting the Level of Community Readiness Towards COVID-19

Binary Logistic regression was performed to assess the association of each independent variable with a level of community readiness for COVID-19 preventions. The factors that showed a p-value of less than 0.25 were added to the multivariable regression model. The result revealed that on the binary logistic regression: age, sex, marital status, residence, religion, educational status, occupation, and family size were significantly associated with the level of community readiness for COVID-19 prevention.

In multivariable logistic regression, all significant variables in binary logistic regression were adjusted. The result showed that the odd of readiness for COVID-19 prevention was 1.4 times more likely on females (AOR: 1.388, 95% CI: 1.050–1.834) as compared to males.



**Table 2** Knowledge of Study Participants on COVID-19 in Awi Zone, Amhara Region, Ethiopia, 2020

Variables	Category	Frequency	Percent
COVID-19 is a contagious disease	True	1345	94.5
	False	38	2.7
	I do not know	40	2.8
Know what cause about COVID-19	Yes	1052	73.9
	No	371	26.1
If yes which one	Virus	941	89.4
	Fungus	30	2.9
	Bacteria	43	4.1
	Parasite	19	1.8
	Others*	19	1.8
The incubation period of COVID-19	2 weeks	945	66.4
	3 weeks	97	6.8
	5 and above 5 weeks	23	1.6
	I do not know	358	25.2
Sign and symptoms of COVID-19	Fever	618	43.4
	Cough	726	51.0
	Sore throat	428	30.1
	Fatigue	47	3.3
	Headache	327	23.0
	All	572	40.2
Stuffy nose, runny nose, and sneezing are less common in COVID-19 patients	True	786	55.2
	False	454	31.9
	I do not know	183	12.9
Patients with underlying chronic disease are at higher risk of severe infection and death	True	1260	88.5
	False	75	5.3
	I do not know	88	6.2
COVID-19 could be fatal	True	1297	91.1
	False	99	7.0
	I do not know	27	1.9
COVID-19 vaccine is not available on the market	True	1044	73.4
	False	138	9.7
	I do not know	241	16.9
The majority (80%) of asymptomatic patients can transmit the infection to healthy individuals	True	908	63.8
	False	124	8.7
	I do not know	391	27.5
Elderly patients are at higher risk of acquiring the infection	True	1184	83.2
	False	95	6.7
	I do not know	144	10.1
Eating wild animals would result in infection	True	831	58.4
	False	203	14.3
	I do not know	389	27.3
The prevalence of COVID-19 is increasing in Ethiopia	True	1264	88.8
	False	74	5.2
	I do not know	85	6.0

(Continued)

**Table 2** (Continued).

Variables	Category	Frequency	Percent
COVID-19 is transmitted by close contact and respiratory droplets	True	1275	89.6
	False	67	4.7
	I do not know	81	5.7
COVID-19 can be transmitted directly through contact with infected persons	True	1292	90.8
	False	62	4.4
	I do not know	69	4.8
COVID-19 is preventable by minimizing movements to crowded places	True	1266	89.0
	False	87	6.1
	I do not know	70	4.9
Isolation and treatment of suspected and infected individuals are effective ways to reduce transmission	True	1279	89.9
	False	111	7.8
	I do not know	33	2.3
Children and adults need to take measures	True	1297	91.1
	False	64	4.5
	I do not know	62	4.4
Nowadays there is no effective cure for COVID-19	True	1255	88.2
	False	75	5.3
	I do not know	93	6.5
The disease is more dangerous in pregnant women	True	1215	85.4
	False	68	4.8
	I do not know	140	9.8
COVID-19 is airborne	True	1139	80.0
	False	235	16.5
	I do not know	49	3.4
All persons who acquire infection will not always develop severe infection	True	949	66.7
	False	243	17.1
	I do not know	231	16.2
Wearing masks can prevent acquiring infection of COVID-19	True	1238	87.0
	False	83	5.8
	I do not know	102	7.2
Contacted people should be immediately isolated	True	1295	91.0
	False	71	5.0
	I do not know	57	4.0
<b>Knowledge</b>	Good	1090	76.6
	Poor	333	23.4

**Note:** Others\*, protozoa, toxins and pig meat.

Marital status was also significantly associated with the level of community readiness for COVID-19 prevention measures. Those married mothers were 3.12 times higher odds of ready for COVID-19 preventions (AOR: 3.116; 95% CI: 1.592–6.099) compared to their counterparts. The likelihood of the level of community readiness for

COVID-19 prevention was 2.4 higher among Muslims (AOR: 2.392; 95% CI: 1.503–3.806) than Orthodox Christianity followers. The odds of readiness for COVID-19 prevention in study participants who can read and write were 2 more likely compared to their counterparts (Table 6).

**Table 3** Respondents Attitude Towards COVID-19 in Awi Zone, Amhara Region, Ethiopia, 2020

Variables	Category	Frequency	Percent
Do you believe/agree early recognition can improve treatment and recovery from COVID-19	Yes	1227	86.2
	No	113	7.9
	Neutral	83	5.8
Do you believe COVID-19 is preventable	Yes	1233	86.6
	No	110	7.7
	Neutral	80	5.6
Do you believe that health education can prevent infection	Yes	1249	87.8
	No	101	7.1
	Neutral	73	5.1
Do you believe that COVID-19 can be avoided by applying proper percussions	Yes	1222	85.9
	No	121	8.5
	Neutral	80	5.6
Do you believe COVID patients should disclose their exposure	Yes	1188	83.5
	No	165	11.6
	Neutral	70	4.9
When you meet your friends do you believe you will not greet with a handshake	Yes	882	62.0
	No	471	33.1
	Neutral	70	4.9
Do you believe that COVID-19 is a curable disease	Yes	1000	70.3
	No	274	19.3
	Neutral	149	10.5
When you meet your friends do you believe that you will not always greet with a hug	Yes	812	57.1
	No	543	38.2
	Neutral	68	4.8
Do you agree COVID will not always lead to death	Yes	836	58.7
	No	449	31.6
	Neutral	138	9.7
If you get contacted person do you agree you will inform to health authorities	Yes	1130	79.4
	No	185	13.0
	Neutral	108	7.6
Do you believe you will accept isolation	Yes	1213	85.2
	No	140	9.8
	Neutral	70	4.9
Do you believe that distributing flyers and brochures is important	Yes	1137	79.9
	No	118	8.3
	Neutral	168	11.8
Do you believe herbal and traditional medicine is better than modern medicine	Yes	577	40.5
	No	688	48.3
	Neutral	158	11.1
Do you believe COVID is disseminated due to our sins committed/God punishment	Yes	1026	72.1
	No	293	20.6
	Neutral	104	7.3
Do you believe Compliance with the ministry of health precaution will prevent the spread	Yes	1218	85.6
	No	137	9.6

(Continued)



**Table 3** (Continued).

Variables	Category	Frequency	Percent
	Neutral	68	4.8
Do you believe Authorities should close schools if case increase	Yes No Neutral	1180 171 72	82.9 12.0 5.1
Do you believe healthy food and water can increase the body's immunity	Yes No Neutral	1161 183 79	81.6 12.9 5.6
Do you believe authorities should be prepared to restrict access to religious places if the case increase	Yes No Neutral	832 499 92	58.5 35.1 6.5
Do you believe contacted peoples should immediately be quarantined	Yes No Neutral	1173 162 88	82.4 11.4 6.2
Do you agree that if the case increase authorities should lock down the city	Yes No Neutral	1078 270 75	75.8 19.0 5.3
Do you believe washing hands before and after contact is important	Yes No Neutral	1174 163 86	82.5 11.5 6.0
Do you agree COVID is finally successfully controlled	Yes No Neutral	917 270 236	64.4 19.0 16.6
Do you consider COVID is a threat to the whole community	Yes No Neutral	1201 111 111	84.4 7.8 7.8
Do you believe infected persons can infect others without sign and symptoms	Yes No Neutral	1113 141 169	78.2 9.9 11.9
Do you believe traveling to crowded place can increase transmission	Yes No Neutral	1210 123 90	85.0 8.6 6.3
Do you believe having no mask can increase transmission	Yes No Neutral	1119 177 127	78.6 12.4 8.9
Do you agree virus can transmit animals to humans and vice versa	Yes No Neutral	769 332 322	54.0 23.3 22.6
Do you believe that drinking local alcohol and hot drinks can prevent infection of COVID-19	Yes No Neutral	659 560 204	46.3 39.4 14.3
<b>Attitude</b>	Positive Negative	973 450	68.4 31.6

**Table 4** Study Participant's Perception of COVID-19 in Awi Zone, Amhara Region, Ethiopia, 2020

Variables	Category	Frequency	Percent
Do you perceive that corona is scary	Yes	1212	85.2
	No	138	9.7
	Neutral	73	5.1
Do you perceive you/your family will probably get the illness	Yes	1197	84.1
	No	145	10.2
	Neutral	81	5.7
Do you perceive that there is exaggerated media coverage	Yes	754	53.0
	No	463	32.5
	Neutral	206	14.5
Do you perceive that the virus was designed as a biological weapon	Yes	471	33.1
	No	600	42.2
	Neutral	352	24.7
Do you perceive infection was associated with stigma	Yes	642	45.1
	No	442	31.1
	Neutral	339	23.8
Perception	Good	975	68.5
	Poor	448	31.5

## Discussion

This is the first community-based cross-sectional study aimed at assessing the level of community readiness for COVID-19 pandemic prevention and associated factors among residents of Awi Zone, Northwest Ethiopia.

Communities' negligence in preventive measures is the major obstacle to break the spread of the virus. This finding revealed that 20.2% (95% CI, 18.1–22.3) of the study participants were ready on COVID-19 preventive measures. The study found that the prevalence of good knowledge for COVID-19 prevention measures was found to be 76.6% (95% CI, 74.3–78.7), which implies that a majority of the communities had adequate knowledge towards COVID-19. This finding is consistent with other studies that have demonstrated satisfactory levels of knowledge for the pandemic.<sup>27</sup> Nevertheless, in another study conducted among the Addis Zemen Ethiopia,<sup>28</sup> Southwest Ethiopia,<sup>29</sup> Debrebirhan Ethiopia,<sup>30</sup> Bangladesh,<sup>31</sup> Rural China,<sup>21</sup> Paraguayans,<sup>22</sup> Egypt,<sup>15</sup> Yemen,<sup>32</sup> Syrian<sup>33</sup> population, a lower proportion of the study population had sufficient knowledge towards COVID-19 prevention measures when compared with the current study. The difference might be due to the time of the study and the population participated in the study. The majority of the study population in this study found in

rural areas and had no access to electricity and the internet. As a result, they had limited information on COVID-19-related updates and preventive measures posted online by the official government, health authorities, and different media that are shown to have a positive effect on improving knowledge.

This finding is also very low compared to the study in Jimma Ethiopia and china.<sup>18,34</sup> The reason for this discrepancy might be due to a difference in the socioeconomic status of study participants. Moreover, it may also be due to the differences in a tool used for the assessment of knowledge and time of data collection. In these studies, the data were collected during the main phase of the outbreak when most populations were exposed to a lot of information about COVID-19.

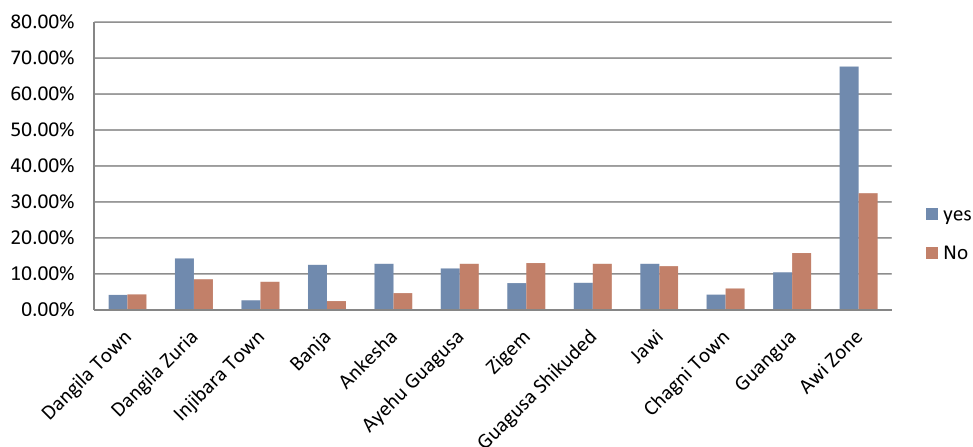
This finding also showed that about 68.4% (95% CI, 65.9–70.8) of the participants have a positive attitude toward COVID-19 preventive measures, which aligns with a study done in Southwest Ethiopia and Paraguay. However, our study has found a better attitude on the prevention of COVID-19 than a study conducted in Addis Zemen Ethiopia which showed that 36.1% of participants had a good attitude towards prevention and control of COVID-19.<sup>35</sup> Moreover, our study was also found to be lower than studies done in Bangladesh,<sup>31</sup> Nepal,<sup>19</sup> and rural China.<sup>21</sup> This variation might be caused by differences in the study area and population, geographic coverage, and number and type of questions used. The current study used large area coverage where most participants were from rural areas that had limited access to information sources than the situation abroad that included urban health facilities with better access to information sources.

The level of practices for the prevention of COVID-19 in Awi Zone, Northwest Ethiopia was 29% (95% CI, 26.8–31.5), which was lower than the study conducted in Iran, 71%,<sup>35</sup> Southwest Ethiopia (59.4%), Addis Zemen Ethiopia,<sup>28</sup> Bangladesh,<sup>31</sup> China,<sup>21</sup> Nepal,<sup>19</sup> but much higher than the study conducted in Thailand, 17%.<sup>36</sup> This inconsistency might be related to variations in the geographic area, the incidence of COVID-19, availability of PPE, training access, and information sources and awareness levels of the community. Our study also found out that 68.5% (95% CI, 66–71) of the study participants had a good perception of COVID-19 preventive measures. In this study, about 85.2% of study participants perceived that corona is scary. This is supported by Chen et al which showed that out of 4016 Anhui

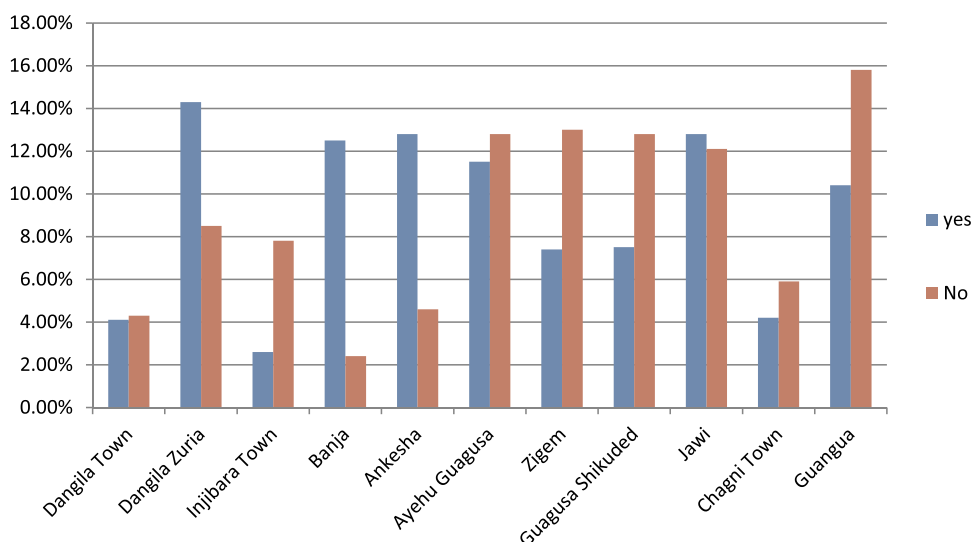
**Table 5** Participants Practice on COVID-19 in Awi Zone, Amhara Region, Ethiopia, 2020

Variables	Category	Frequency	Percent
Did you frequently wash your hands at least for 20 seconds	Yes	897	63.0
	No	526	37.0
Did you apply physical distancing	Yes	811	57.0
	No	612	43.0
Did you avoided consuming outdoor foods	Yes	647	45.5
	No	776	54.5
Did you avoid public transport	Yes	506	35.6
	No	917	64.4
Are you using masks	Yes	498	35.0
	No	925	65.0
Do you buy protective measures if available at an affordable price	Yes	1119	78.6
	No	304	21.4
Did you sneeze between elbows	Yes	1094	76.9
	No	329	23.1
Are you trying to minimize frequent touching of your mouth/nose	Yes	893	62.8
	No	530	37.2
Are you trying to minimize the usual drinking of tea/coffee from a roadside	Yes	921	64.7
	No	502	35.3
Are you participating in social events involving a large number of people like mahiber, edir, equib, senbetie, etc.	Yes	962	67.6
	No	461	32.4
Did you avoid unnecessary vacations	Yes	1041	73.2
	No	382	26.8
Have you started to stay at home	Yes	859	60.4
	No	564	39.6
Did you stop shaking hands while greeting	Yes	1040	73.1
	No	383	26.9
Did you avoided hugging while greeting	Yes	1077	75.7
	No	346	24.3
Did you avoided kissing while greeting	Yes	1058	74.3
	No	365	25.7
Do you pay more attention to your hygiene than usual	Yes	1057	74.3
	No	366	25.7
Do you use disinfectant and solutions to prevent transmission	Yes	529	37.2
	No	894	62.8
Do you use herbal products and traditional medicine to prevent transmission	Yes	433	30.4
	No	990	69.6
<b>Practice</b>	Good	413	29.0
	Poor	1010	71.0

## Social distancing

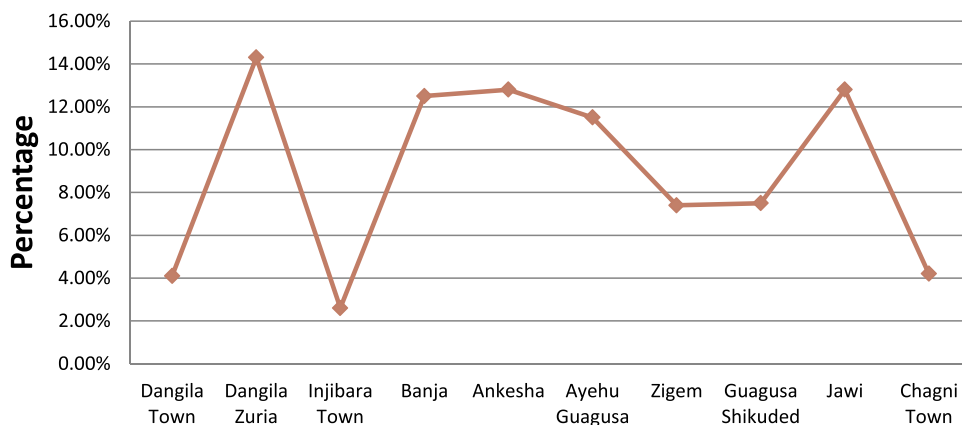


**Figure 1** Participation of Awi zone communities in social events involving a large number of people like mahiber, edir, equib, senbetie, and religious ceremonies.



**Figure 2** Distribution of mask utilization to prevent COVID-19 in Awi zone, Northwest Ethiopia, 2020.

## Level of community readiness for covid-19 preventive measures



**Figure 3** Study participants level of community readiness for COVID-19 prevention in Awi zone, Amhara region, Ethiopia, 2020.

**Table 6** Factors Affecting the Level of Community Readiness Towards COVID-19 in Awi Zone, Amhara Region, Ethiopia, 2020

Variables		Level of Community Readiness		95% Confidence Interval	
		Yes	No	COR	AOR
Age	18–29 years	147(22.9% %)	496(77.1%)	I	I
	30–49 years	117(19.0%)	500(81%)	0.790(0.601–1.04)	0.753(0.537–1.055)
	≥50 years	24(14.7%)	139(85.3%)	0.583(0.364–0.93)	0.703(0.400–1.234)
Sex	Male	142(18.3%)	636(81.7%)	I	I
	Female	146(22.6%)	499(77.4%)	1.310(1.01–1.698)	1.388(1.05–1.83)*
Marital status	Single	98(20%)	392(80%)	2.636(1.367–5.08)	2.345(1.13–4.86)*
	Married	179(22.2%)	627(78.8%)	3.011(1.587–5.71)	3.116(1.59–6.09)*
	Others	288(20.2%)	1135(79.8%)	I	I
Residence	Urban	125(22%)	443(78%)	1.198(0.92–1.556)	1.231(0.907–1.67)
	Rural	163(19.1%)	692(80.9%)	I	I
Religion	Orthodox Christian	242(18.8%)	1036(81.1%)	I	I
	Muslim	37(34.6%)	70(65.4%)	2.263(1.48–3.452)	2.392(1.50–3.81)*
	Others <sup>a</sup>	9(23.7%)	29(76.3%)	1.329(0.621–2.843)	
Educational status	No formal education	61(16.4%)	312(83.6%)	I	I
	Read and write	72(27.3%)	192(72.7%)	1.918(1.304–2.82)	1.986(1.31–3.01)*
	Primary	27(16.2%)	140(83.8%)	0.986(0.60–1.618)	0.827(0.466–1.466)
	Secondary	42(24.1%)	132(75.9%)	1.627(1.045–2.53)	1.282(0.712–2.307)
	Collage and above	86(19.3%)	359(80.7%)	1.225(0.85–1.759)	1.23(0.686–2.205)
Occupation	Farmer	97(18.9%)	416(81.1%)	I	I
	Merchant	43(17.3%)	205(82.7%)	0.90(0.605–1.337)	0.747(0.459–1.216)
	Student	45(26.6%)	124(73.4%)	1.556(1.037–2.34)	1.293(0.720–2.322)
	Private employee	12(17.6%)	56(82.4%)	0.919(0.47–1.781)	0.733(0.342–1.575)
	Government employee	62(18.1%)	281(81.9%)	0.946(0.66–1.347)	0.814(0.460–1.442)
	Others <sup>b</sup>	29(35.4%)	53(64.6%)	2.347(1.418–3.88)	1.718(0.960–3.073)
Family size	<4	167(19.9%)	674(80.1%)	1.388(0.78–2.466)	1.469(0.784–2.752)
	4–7	106(21.9%)	377(78.1%)	1.575(0.873–2.84)	1.634(0.877–3.047)
	>7	15(15.2%)	84(84.8%)	I	I

**Notes:** \*Significant at p-value ≤0.05. Others<sup>a</sup>, Protestant and Catholic. Others<sup>b</sup>, housewife, driver, daily labor.

**Abbreviations:** COR, crude odds ratio; AOR, adjusted odds ratio; I, reference; CI, confidence interval.

Province residents 92.6% think that this pandemic is scary.<sup>17</sup>

One of the important findings in this study is that surprisingly nearly three-fourth of the study participants did not use masks and about 67.6% of participants were involved in large social events like mahiber, edir, equib, tesker, senbetie, etc. This is very high compared to the finding from China,<sup>18</sup> and it is also contrary to the WHO recommendations.<sup>37</sup> This figure is very frustrating in the case of Ethiopia, where the community transmission of COVID-19 is more likely.<sup>38,39</sup>

This study also explores the association between socio-demographic variables with the level of community readiness towards COVID-19 preventive measures. Therefore, this finding revealed that sex, marital status, religion, and

educational status were significantly associated with the level of community readiness towards COVID-19 preventive measures. This finding revealed that education is significantly associated with the level of community readiness towards COVID-19 preventive measures. Even though there is no similar study done anywhere about the level of community readiness toward COVID-19 prevention measures, there are studies that support the association of educational level with perception and knowledge toward COVID-19 prevention measures. For instance, the study was done in China,<sup>18</sup> Paraguayans<sup>23</sup> Egyptians,<sup>15</sup> Mizan Aman,<sup>40</sup> Arbaminch town,<sup>27</sup> and Northwest Ethiopia<sup>41</sup> showed the association of educational status with perception, attitude and knowledge of study participants toward COVID-19 prevention measures. This might

be because education is the main driving force for everything which may make respondents internalize the risk analysis of the disease. The other possibilities might be due to participants who have higher educational levels could have better chances to access different COVID-19 related information and better to avoid a misconception and poor interpretations about the severity of the disease.

The likelihood of the level of community readiness for COVID-19 prevention was also higher among Muslims than Orthodox Christianity followers. This could be explained by Muslim participants had religious wearing nature and frequent hand washing practice particularly in females which might make themselves more protective than Christian religion followers. Lastly, being female and married women were also significantly associated with the level of community readiness toward COVID-19 prevention measures.

## Conclusion and Recommendation

This study depicted that Awi zone communities were good in knowledge, positive attitude, and good perception of COVID-19 preventive measures. However, most participants had poor practices for COVID-19 preventive measures. Some of the major preventive actions like physical distancing, using a mask, and avoiding attending crowded populations were perceived as very difficult by a large proportion of the population. In this study, sex, marital status, religion, and educational status were significantly associated with the level of community readiness towards COVID-19 preventive measures. Even though, there is good knowledge, positive attitude, and good perception; a practice on the COVID-19 preventive measure was poor. Health education programs aimed at mobilizing and improving COVID-19 related level of community readiness especially practice are urgently needed.

Awareness creation programs on more targeted groups, such as men, unmarried, and those with low educational levels are required to improve the level of community readiness on the prevention of the COVID-19 pandemic. Advocacy of hand hygiene, physical distancing, use of mask, and other strategies should be more accomplished with respective bodies. As per finding increasing health education programs regarding the pandemic via different mass and Social Media, coordinated and combined efforts of Ethiopian authorities and all individuals will be needed to battle the multidimensional consequences of the pandemic.

Religious leaders should teach believers by interacting with faith and science on the means of preventing the

pandemic. Every individual should apply and follow the government's (Federal Ministry of Health) directions to control the distribution of the pandemic. It is also recommended that mixed methods research, program evaluations, and longitudinal research efforts should be undertaken to explore and address the effect of COVID-19 on Awi zone communities.

## Strength and Limitation of the Study

Our study was a large community-based study design and had a broad scope with several strengths. It was based on a large sample size with population size to proportion allocation and focused on participants from rural areas; therefore, the findings can be generalized across the Awi zone (district) populations. Unlike other studies, we undertook face-to-face interviews and strict supervision with the Awi zone health bureau in this challenging situation, which is a strength. However, it has also the limitations of this study. There was no previously standardized and validated tool to assess the level of community readiness and associated factors towards COVID-19 prevention. We also did not find sufficient data to compare and contrast the level of community readiness with others, and it makes our discussion shallow. Our study also shares the limitation of the study design.

## Abbreviations

APHI, Amhara region Public Health Institution; CFR, Case-Fatality Rate; CDC, Center for Disease Control; LMIC, Low-and-middle-income countries; MERS, Middle East Respiratory Syndrome; PPE, Personal Protective Equipment's; PHEIC, Public Health Emergency of International Concern; SARS, Severe Acute Respiratory Syndrome; SARS-CoV2, Severe Acute Respiratory Syndrome Coronavirus 2; WHO, World Health Organization.

## Data Sharing Statement

All related data has been presented within the manuscript. The data set supporting the conclusions of this article is available from the corresponding author on request.

## Ethical Approval and Consent to Participate

The study was conducted in accordance with the Declaration of Helsinki. Before conducting the study,



ethical clearance was obtained from the Amhara Public Health Institute Research Ethics Review Committee (Ref No. RTTD/811). Explanation about the purpose of the study and a letter of support was given to administrative bodies of the Awi zone. Written informed consent was obtained from each participant after clearly describing the purpose, benefit, and risk of the study. Study participants were informed of their full right to withdraw their participation at any stage of the interviewee. Confidentiality was maintained by using anonymous questionnaires.

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## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors report no conflicts of interest for this work.

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