

Community Awareness, Perception and Preventive Practices towards COVID-19 in Tigray

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Abstract

Introduction-Novel coronavirus disease is a very fast spreading and fatal respiratory disease which is a public health emergency and pandemic across the world. Despite many efforts by countries, organizations, and institutions to prevent and control, the pandemic remains a world public health problem. Ethiopia is one of the countries which are severely affected by the pandemic.

Objective- The aim of the study was to assess the community awareness, perception and preventive practices towards COVID-19 in Tigray

Method- The study was conducted in three zones of Tigray regional state, northern Ethiopia from January to May 2021, namely eastern, south east and Mekelle zones. Residents of the selected districts aged 18 years and above were included in the study through cross sectional study design. The sample size was 634 and study participants were selected using systematic random sampling. Standardized structured questionnaire adopted from “RESPONDING TO COVID-19 IN AFRICA SURVEY” conducted by CDC was developed and administered through face to face interview. Data entry was made in to Stata 14 statistical software and data cleaning was done strictly. Finally, the Stata data set was analyzed and presented according to the objective of the study. Ethical clearance was sought from Mekelle University, College of Health Sciences Institutional Review board (IRB). Support letter was written from the interim administration of Tigray Region to respective zones and districts.

Result- In this study 61%, 95% CI (57%, 65%) participants had good awareness on covid-19 infection prevention and sign and symptoms of corona virus infection. Similarly, 63%, 95% CI (59%, 66%) had a favorable perception towards Covid-19 prevention measure, estimated risk and seriousness as well as application of the recommended guidelines. Besides, only 27%, 95% CI (24%, 30%) of them had overall good Covid-19 prevention practice.

Conclusion and recommendation-Notably, there is alarmingly poor practice regarding the Covid-19 pandemic prevention. Upper educational level and employed were independent predictors of good awareness and favorable perception. Older age, being employed and living together with increased family members predicted good prevention practice. Considering the crises on the ground, Tigray community requires additional high scale support in sanitary, Covid-19 prevention supplies and interventions.

Introduction

Corona virus which is named as “novel coronavirus disease 2019 (COVID-19)” is Ribonucleic Acid (RNA) virus; currently spreading worldwide in an alarming rate. The disease causes a severe acute respiratory syndrome(1).It was first identified in animals and labeled as a zoonotic disease which is transmitted from animal to human, and from human to human through direct contact and airway droplets(2).It was named as the third pandemic since the establishment of the WHO, next to the Hong Kong flu in 1968 and H1N1 flu in 2009(3). In Africa, the first confirmed case of COVID-19 was reported in Egypt on February 14, 2020. Since then, the number of cases has continued to increase with Ethiopia, the Democratic Republic of Congo (DRC), Nigeria, Sudan, Angola, Tanzania, Ghana, and Kenya identified as vulnerable countries(4).

Patients who are infected with COVID-19 shows a clinical features of fever, dry cough, fatigue, myalgia, shortness of breath/dyspnea, and sore throat within 14 days of the incubation period(5, 6).In more severe cases, it can also cause pneumonia, severe acute respiratory syndrome, kidney failure, and even death(7, 8).

Despite many efforts by countries, organizations, and institutions to prevent and control, the pandemic remains a world public health problem. Ethiopia is one of the countries which are severely affected by the pandemic(9). Ethiopia is one of Africa’s air-traffic hubs with many airlines coming in from Central and South America, North America, Europe, and Asia, including China(10). Accordingly, the United Nations (UN) identified Ethiopia as a major country for supplying COVID-19 medical supplies throughout Africa and emphasized the importance of COVID-19 management in the Ethiopian region(11, 12). As of 24 January 2021, the Ethiopian ministry of health (MoH) reported 133,767 coronavirus (COVID-19) cases and 2066 deaths in the country(13).

In a developing country like Ethiopia, where trained human resources and equipment for the treatment of COVID-19 are scarce, working on prevention of the viral spread should be a priority and feasible intervention.The risk of transmission from asymptomatic individuals is high, making the disease difficult to control (14, 15). Preventive measures include, social distancing/avoiding crowds (staying at

home), physical distancing (2 meter apart) if going out is necessary, wearing standard face mask consistently, washing hands or using sanitizer regularly and avoid to touch face (eyes, nose, mouth)(16).

People's adherence to and success of preventive and control measures is affected by their knowledge, attitude and practices (KAP) towards the pandemic. Thus, having documented evidence on Knowledge, perception and practice of general population towards the transmission and prevention of COVID-19 plays vital role for effective control measures(17). Improved community knowledge, attitude, and practice about COVID-19 preventive measures play an essential role to increase public readiness to behavioral change measures and have been recommended to control the spread of this disease(18).

Since the onset of the disease different studies have been conducted across the globe and these studies showed variations on the level of community understanding towards the disease, risk perception and adherence towards its prevention of COVID-19. Study conducted in South Korea, Ethiopia and democratic republic Congo showed significant difference in

awareness, perception and practice of preventive measures of COVID-19(4).

Therefore, the purpose of this study was to reveal the current realities about awareness, perception and preventive practices of COVID-19 pandemic among residents of Tigray region.

Methodology

Study area, period and design

The study was conducted in three zones of Tigray region namely, Mekelle, Eastern and south Eastern Zones. Three sub-cities from Mekelle and 2 districts from the rest two zones were included in the study. It was conducted from January to May 2021 and it employed cross sectional study design.

Sample size determination and sampling procedure

Residents of the selected districts aged 18 years and above were included in the study. A single population proportion formula was used to estimate the number of study participants to be included in the study by taking the following assumptions in to account. Considering community perception/awareness/practices 50% (since we did not have previous study in this regard), 95% confidence level ($Z_{\alpha/2}$) and margin of error of 5% (d), the estimated

sample size was 384. Since it is multistage sampling we considered design effect of 1.5, so the sample size was 576. By adding 10% non-response rate the final sample size became 634. In this study multistage sampling technique was employed. We included 3 zones out of the 7 zones in the region randomly. Then 2 districts from each zone were included. Finally, study participants were selected using systematic random sampling

Data collection

A standardized structured questionnaire adopted from “RESPONDING TO COVID-19 IN AFRICA SURVEY” conducted by CDC has been developed and was administered through face to face interview. A total of 16 data collectors were involved in the study. A total of 6 supervisors were recruited to collect the study. The data collectors were having a minimum of BSc degrees in the fields of health sciences. Similarly, supervisors were having at least MSc/MPH degree.

Data management and analysis

Collected data were checked for any errors, missing and inconsistencies on daily basis and were corrected according to the nature of the errors identified and documented. Data entry was made in to Stata 14 statistical

software and data cleaning was done strictly. Finally, the Stata data set was analyzed according to the objective of the study.

Quality assurance mechanism

Before the field work research team member, supervisors and data collectors were familiarized themselves with the tool and procedures of data collection. Moreover, data collectors with adequate experience were recruited; training was given for data collectors and supervisors and it was followed by pretest. The training included power point presentation on the overall essence of the research and data collection that was followed by discussion on the tool one by one. Smooth and timely discussion among the research team, supervisors and data collectors as well as feedbacks and debriefing was done on daily basis.

Necessary measures were taken throughout the research process to safeguard the research team members, data collectors and study participants from COVID-19. Hence, mask and sanitizer were used and social distancing (2 m apart) was practiced.

Ethical clearance

Ethical clearance was sought from Mekelle University, College of Health Sciences Institutional Review board (IRB). Support letter was written from the interim

administration of Tigray Regional to respective zones and districts. Willingness of study participants was confirmed and they were told that withdrawal or decline to participate in the study would not result in any loss to which they are otherwise entitled including denial of any health care service. Participants were not exposed to any risks apart from the time spent during interview for participating in the study. The study is anonymous in which any participant information were not revealed; all information given by the study participants were kept confidential. Finally written informed consent was obtained from study participant. Results

Socio demographic characteristics of respondents

A total of 634 participants were included in the analyses. The median age of the respondents was 32 with 14 IQR; and the minimum age of participants was 18 and 80 was the maximum age of participant. Participants were enrolled from three zones; Eastern 100 (15.8%), Mekelle 409(64.5%) and Southern Zone 125(19.7%). Four hundred three (63.6%) of the participants were male, majority of the respondents were either married 328(51.7%). Regarding educational preparation, 491(77.4%) had secondary or higher education preparation. Concerning occupation, 230(36.3%) were governmental and 117 (18.5%) were nongovernmental employee. Regarding family size, around 160(24.6%) lives with more than five people together (Table 1).

Table 1. Socio-demographic characteristics of respondents, Tigray 2021; n = 634.

Variable and response	n(%)	Awareness n(%)		Perceptionn(%)		Practice n(%)	
		Poor	Good	Poor	Good	Poor	Good
Residence							
Mekelle Zone	409(64.5)	176(71)	233(60.4)	18(7.6)	82(20.7)	63(13.6)	37(21.6)
Southern Zone	125(19.7)	53(21.4)	72(18.7)	161(67.9)	248(62.5)	332(71.7)	77(45)
Eastern Zone	100(15.8)	19(7.7)	81(21)	58(24.5)	67(16.9)	68(14.7)	57(33.3)
Gender							
Male	403(63.6)	145(58.5)	258(66.8)	135(57)	208(67.5)	295(63.7)	108(63.2)
Female	231(36.4)	103(41.5)	128(33.2)	102(43)	129(32.5)	168(36.3)	63(36.8)
Marital status							
Married	328(51.7)	132(53.2)	196(50.8)	124(52.3)	204(51.4)	239(51.6)	89(52)
Single	266(42)	90(36.3)	176(45.6)	93(39.2)	173(43.6)	193(41.7)	73(42.7)
Divorced	24(3.8)	15(6)	9(2.3)	11(4.6)	13(3.3)	21(4.5)	3(1.8)
Widowed/ Separate	16(2.5)	11(4.4)	5(1.3)	9(3.8)	7(1.8)	10(2.2)	6(3.5)
Religion							
Orthodox	552(87.1)	224(90.3)	328(85)	206(86.9)	346(87.2)	411(88.8)	141(82.5)

Muslim	50(7.9)	15(6)	35(9.1)	21(8.9)	29(7.3)	37(8)	13(7.6)
Catholic	24(3.8)	5(2)	19(4.9)	7(3)	17(4.3)	9(1.9)	15(8.8)
Others	8(1.3)	4(1.6)	4(1)	3(1.3)	5(1.3)	6(1.3)	2(1.2)
Ethnicity							
Tigraway	626(98.7)	245(98.8)	381(98.7)	232(97.9)	394(99.2)	459(99.1)	167(97.7)
Others	8(1.3)	3(1.2)	5(1.3)	5(2.1)	3(0.8)	4(0.9)	4(2.3)
Educational Level							
No education	45(7.1)	40(16.1)	5(1.3)	33(13.9)	12(3)	36(7.8)	9(5.3)
Read and write	38(6)	24(9.7)	14(3.6)	21(8.9)	17(4.3)	27(5.8)	11(6.4)
Primary	60(9.5)	29(11.7)	31(8)	29(12.2)	31(7.8)	41(8.9)	19(11.1)
Secondary and higher	491(77.4)	155(62.5)	336(87)	154(65)	337(84.9)	359(77.5)	132(77.2)
Occupation							
House wife	78(12.3)	51(20.6)	27(7)	43(18.1)	35(8.8)	52(11.2)	26(15.2)
Government	230(36.3)	74(29.8)	156(40.4)	68(28.7)	162(40.8)	175(37.8)	55(32.2)
Nongovernment	117(18.5)	31(12.5)	86(22.3)	36(15.2)	81(20.4)	80(17.3)	37(21.6)
Private organization	141(22.2)	68(27.4)	73(18.9)	66(27.8)	75(18.9)	104(22.5)	37(21.6)
Daily laborer	15(2.4)	5(2)	10(2.6)	6(2.5)	9(2.3)	10(2.2)	5(2.9)
Others	53(8.4)	19(7.7)	34(8.8)	18(7.6)	35(8.8)	42(9.1)	11(6.4)
Number of people living together							
Live alone	47(7.4)	14(5.6)	33(8.5)	13(5.5)	34(8.6)	40(8.6)	7(4.1)
Live with 2-4 people	431(68)	169(68.1)	262(67.9)	162(68.4)	269(67.8)	310(67.0)	121(70.8)
Live with >5 people	156(24.6)	65(26.2)	91(23.6)	62(26.2)	94(23.7)	113(24.4)	43(25.1)

Participant's awareness on COVID-19

Participant's awareness was assessed focusing on means of prevention, covid-19 sign and symptoms, perceived risk groups and community awareness on possibility of herbal cure. Among the participants, 524(82.6%) agreed hand washing prevent from catching the disease. Wearing mask when at around others believed as preventive measure by 438 (69.1%) and only 136 (21.5%) participant perceive, not engaging with a person who recovered from Covid-19 disease is necessary to prevent further spread. Regarding awareness on Covid-19 symptoms, 345(54.4%) participants strongly agreed for the statement that reminds 'infected people might show signs of corona virus within 5 to 14 days' and 407 (64.2%) participants were definitely sure for the existence of carrier peoples who can infect others without showing any sign and symptom. On the other hand, only 305(48.1%) were certainly sure Covid-19 cannot be cured by herbal medicine and 214(33.8%) were mindful and didn't believe avoidance of health care workers as special risky group is not necessarily important to prevent the virus spread. Generally, 386(60.9%) participants correctly scored four or more among the prepared seven items that

assess participant’s awareness to covid-19. Hence, 61%, 95% CI (57%, 65%) participants had good awareness on covid-19 infection prevention, sign and symptoms, corona virus case

Community perception towards Covid-19

Participants were requested to respond their perception on importance of mask use, confidence on information given by government and perception towards corona virus risk. At the time of the survey, 461(72.7%) participants had a face mask ready to use. Regarding face mask, 246 (38.8%) participants believes distancing from peoples who wear a mask is a mandatory act since they might be infected. The majority, 573(90.4%) appreciate peoples who wear mask for their carefulness and protective behavior to others. However, 98(15.5%) believe face mask is unlikely to prevent the virus and those who wear it are fooled. Regarding the area, in their locality 518(81.7%) believe corona virus will affect many peoples in their locality and 457(72.1%) participants were confident on the information given and measures like restrictions done by government to reduce risk of getting Covid-19.

Generally, 63%, 95% CI (59%, 66%) had a favorable perception towards Covid-19 prevention measure, estimated risk and seriousness and volubility of the recommended guidelines

Considering the area and situations in their residence participants were requested to determine their level of risk for catching covid-19; and 281(44.3%) perceived as they are at higher risk for corona virus infection; and 305(48.1%) believe Covid-19 infection could seriously affect their health condition (Figure 1)

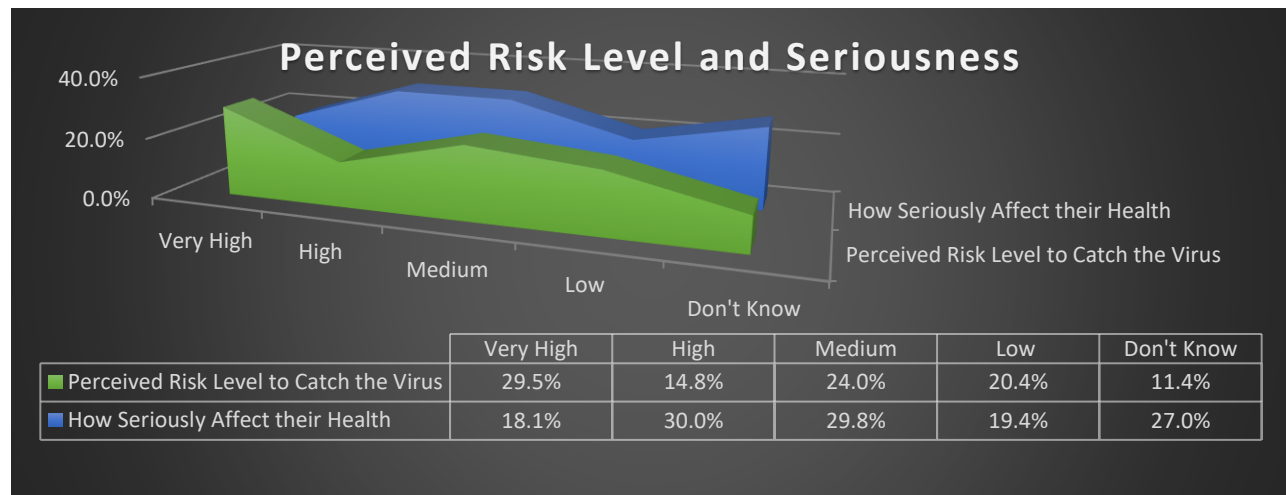


Figure 1: Result on participants Covid-19 risk level and perceived seriousness if it caught them, Tigray, 2021

It is known that, the Ethiopian government used to disseminate public health guidelines recommended to restrict the spread of corona virus. Those are issues like maintaining a minimum distance from peoples not in regular contact, and limiting the number of peoples who can gather together. On this regard, 509(80.3%) believe taking these actions will help them from getting infected with corona virus, 498(78.5%) agreed this action protect other members of their household from the virus and 504(79.5%) agreed that, following these recommended guidelines will protect others who come in contact with them from Covid-19. **Community Practice on Covid-19 prevention**

Participants were requested to respond to what extent does they apply the recommended guidelines a week ahead of the survey to protect themselves from covid-19 infection. In the week presiding the survey, 161(25.4%) completely and

135(21.3%) mostly wash with soap or frequently sanitize their hand; but, 101(15.9%) never apply it that week. Only 80(12.6%) completely and 110(17.4%) mostly avoided hand shaking and physical greeting. Regarding limit of unnecessary movement, 154(24.3%) tried to stay at home other than going to work, school and 219(34.5%) reduced market, grocery or doing less necessary activities. In contrary to the recommendation, 349(55%) never avoided frequent church/mosque visit, and 210(33.1%) never avoid public gathering and visit to entertainment place the week before the survey. Among the participants only 175(27.6%) used to wear a mask when they are in public or near to others in that week. Merging the completely and mostly applied responses, hand washing and frequent use of hand sanitizer was the highly practiced prevention activity 296 (46.7%), and avoiding frequent visit to church/mosque was the least scored 130(20.5%) practice. Generally, 27%, 95% CI (24%, 30%) had overall good Covid-19 prevention practice (Figure 2).

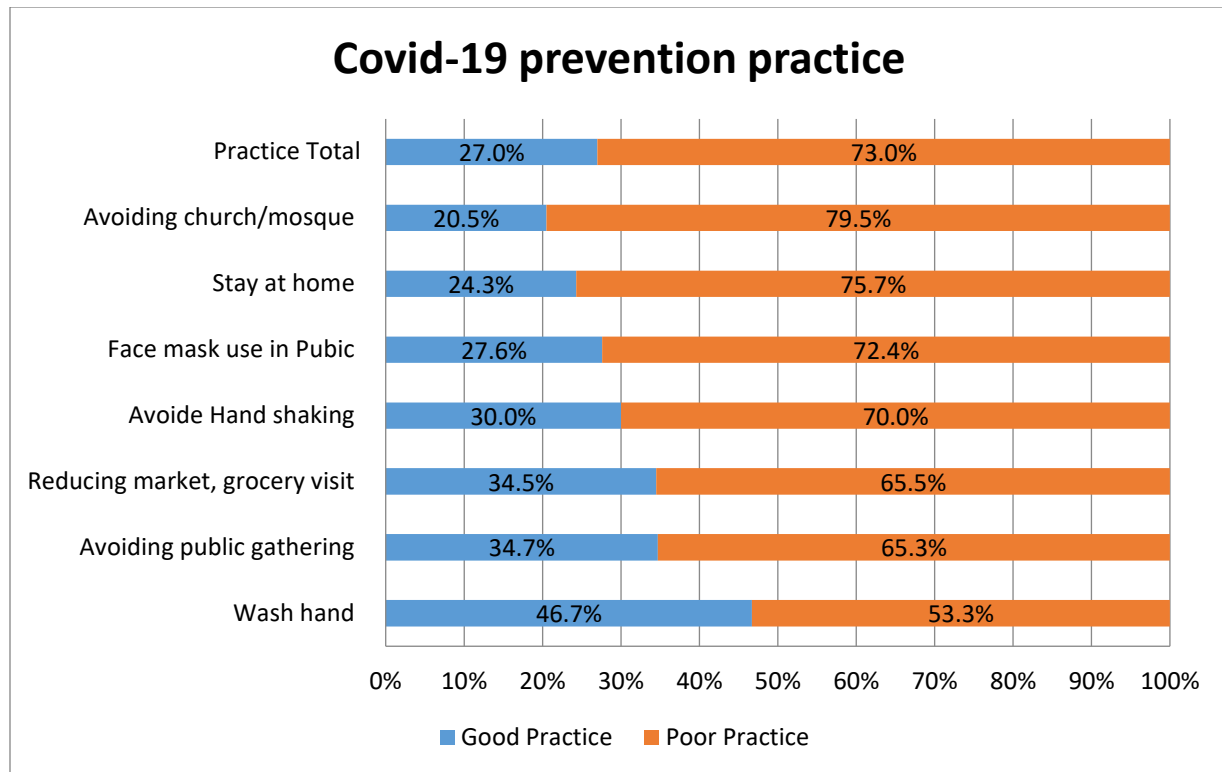


Figure 2. Community Covid-19 prevention practice, Tigray 2021

The same questions were asked to assess participant's intuitive feeling to these practices and the extent they appraise necessity of those recommended guidelines by peoples around them in the month before the survey. Asking peoples to frequently wash their hand or sanitize it by antiseptic was absolutely necessary to 453(71.5%) of the participants. Three hundred fifty-five (56%) can absolutely ask others to avoid hand shaking or physical greeting. Asking peoples to stay at home other than going to work, school or other regular activity and asking to reduce market or grocery visit was

absolutely necessary to 187(29.5%) and 225(35.5%) participants respectively. Similarly, asking peoples to avoid church/mosque visit 123(19.4%), and avoid public gathering or entertainment 293(46.2%) believed as absolutely necessary by the participants. Asking peoples to use a face mask when in public or near to others was absolutely necessary act for 365(57.3%) study participants

Factors that affect community Awareness towards Covid-19

In in the bivariate analyses, socio-demographic characteristics of the

respondents such as sex, age, marital status, occupation, educational status, and family size showed a significant association with awareness score on covid-19 prevention measures. However, occupation and educational status showed a significant association in the multivariable regression. In this study, being employee (governmental or non-governmental) doubled the probability of having good awareness on covid-19 prevention measures compared to those housewives, AOR: 2.0, CI 95%:

(1.0,3.9). Participant's awareness also showed a varied difference across educational level. Compared to those not educated, those who can read and write were 3.7 times higher AOR: 3.7, CI 95%: (1.1,12.2), persons who attend elementary school were 5.8 times higher AOR: 5.8, CI 95%: (1.9,17.8), and those who attend high school and above were 9.4 times AOR: 9.4, CI 95%: (3.4,25.9) more likely to have a good awareness on covid-19 prevention measures (Table 2).

Table 2. Bivariate and multivariable Binary logistic regression analyses of socio-demographic factors associated with Awareness towards covid-19 prevention, Tigray, 2021.

Variable	Awareness		COR (95%CI)	AOR (95% CI)	P- Value
	Good N (%)	Poor N (%)			
Sex					
Male	258(64)	145(36)	1.43(1.0,1.99)	0.7(0.4,1.1)	0.19
Female	128(55.4)	103(44.6)	1	1	
Age					
18-24	17(43.6)	22(56.4)	0.60(0.7,1.2)	2.4(0.9,4.3)	0.057
25-35	181(68.3)	84(31.7)	1.69(1.4,5.5)	2.0(0.47,4.1)	0.532
36-45	89(59.7)	60(40.3)	1.16(0.9,3.9)	1.5(0.66,3.5)	0.310
46-55	29(51.8)	27(48.2)	0.84(0.6,3.2)	1.9(0.69,5.6)	0.200
>56	70(56)	55(44)	1	1	
Marital status					
Single	196(59.8)	132(40.2)	3.26(1.1,9.6)	2.2(0.6,7.9)	0.190
Married	176(66.2)	90(33.8)	4.3(1.5,12.7)	3.6(0.9,13.1)	0.057
Divorced	9(37.5)	15(62.5)	1.32(0.3,5.0)	1.5(0.3,7.2)	0.550
Widow/separated	5(31.3)	11(68.8)	1	1	
Occupation					
House Wife	27(34.6)	51(65.4)	1	1	
Employee	242(69.7)	105(30.3)	4.35(2.5,7.3)	2.0(1.0,3.9)	0.027*
Privet business	73(51.8)	68(48.2)	2.0(1.1,3.5)	1.4(0.7,2.8)	0.300
Others (Laborer, un employed)	44(64.7)	24(35.3)	3.4(1.7,6.8)	2.11(0.94,4.7)	0.070
Educational status					
Not educated	5(11.1)	40(88.9)	1	1	
Know read and write	14(36.8)	24(63.2)	4.6(1.4,14.5)	3.7(1.1,12.2)	0.033*
Elementary	31(51.7)	29(48.3)	8.5(2.9,24.6)	5.8(1.9,17.8)	0.002*
High school and above	336(68.4)	155(31.6)	17.3(6.7,44)	9.4(3.4,25.9)	0.0001*
Live together with					
Alone	33(70.2)	14(29.8)	1.6(0.8,3.3)	0.98(0.4,2.22)	0.96
≤ five	262(60.8)	169(36.2)	1.1(0.7,1.6)	0.95(0.1,1.5)	0.80
5 or more people	91(58.3)	65(41.7)	1	1	
Perception on Covid-19					
Favorable	288(72.5)	109(27.5)	3.7(2.6,5.2)	2.96(2.0,4.26)	>0.001
Unfavorable	98(41.4)	139(58.6)	1	1	

Factors that affect community perception towards Covid-19

Analyzing socio-demographic factors that determine community perception on covid-19 prevention measures, bivariate and multivariable binary logistic regression were conducted.

Accordingly, sex, occupation, educational status and participant's awareness showed significant association in the bivariate analyses. Similar to awareness employed (governmental or non-governmental) participants showed a higher odds AOR: 2.2, CI 95%: (1.2,4.0) to have a favorable perception compared to those unemployed participants. In this study those who attend high school and above were 2.7 times more likely to have a favorable perception on

Covid-19 prevention measures compared to those not educated AOR: 2.7, CI 95%: (1.2, 6.0). Participant's awareness on corona virus prevention showed a positive association with their perception. Those who had a good awareness were 2.7 times higher to have a favorable perception on covid-19 prevention measures compared to those with poor awareness AOR: 2.7, CI 95%: (1.8, 3.9) (Table 3).

Table 3. Bivariate and multivariable Binary logistic regression analyses of socio-demographic factors associated with perception towards covid-19 prevention, Tigray, 2021.

Variable	Perception		N	COR (95%CI)	AOR (95% CI)	P- Value
	Favorable N (%)	Unfavorable (%)				
Sex						
Male	268(66.5)	135(33.5)		1.5(1.1,2.1)	1.2(0.8,1.8)	0.260
Female	129(55.8)	102(44.2)		1	1	
Age						
18-24	20(51.3)	19(48.7)		0.67(0.32,1.3)	1.0(0.3,2.7)	0.950
25-35	175(66)	90(34)		1.2(0.93,3.6)	1.12(0.4,2.8)	0.710
36-45	92(61.7)	57(38.3)		1.0(0.7,3.11)	1.0(0.4,2.5)	0.890
46-55	34(60.7)	22(39.3)		0.99(0.52,1.3)	1.1(0.4,3.0)	0.750
>56	76(60.8)	49(39.2)		1	1	
Marital status						
Single	204(62.2)	124(37.8)		2.11(0.76,5.8)	1.0(0.6,1.5)	0.920
Married	173(65)	93(35)		2.3(0.86,6.6)	1.4(0.5,3.7)	0.470
Divorced	13(54.2)	11(45.8)		1.5(0.4,5.42)	0.9(0.3,3.1)	0.960
Widow/separated	7(43.8)	9(56.3)		1	1	
Occupation						
House Wife	35(44.90)	43(55.1)		1	1	
Employee	243(70)	104(30)		2.87(1.7,4.7)	2.2(1.2,4.0)	0.004*
Privet business	75(53.2)	66(46.8)		1.39(0.8,2.4)	1.1(0.6,2.0)	0.711
Others (Laborer, un employed)	44(64.7)	24(35.3)		2.25(1.2,4.4)	1.9(0.9,4.0)	0.085
Educational status						
Not educated	12(26.7)	33(73.3)		1	1	
Know read and write	17(44.7)	21(55.3)		2.22(0.8,5.5)	1.5(0.6,4.2)	0.349
Elementary	31(52.7)	29(48.3)		2.9(1.2,6.7)	1.6(0.6,4.0)	0.281
High school and above	337(68.6)	154(31.7)		6.0(3.0,11.9)	2.7(1.2,6.0)	0.011*
Live together with						
Alone	34(72.3)	13(27.7)		1.7(0.8,3.5)	1.2(0.57,2.8)	0.550
≤ five	269(62.4)	162(37.6)		1.0(0.7,1.5)	0.9(0.6,1.4)	0.800
5 or more people	94(60.3)	62(39.7)		1	1	
Awareness on Covid-19 prevention						
Good	288(74.6)	98(25.4)		3.74(2.6,5.2)	2.7(1.8,3.9)	<0.00 1*
Poor	109(44.0)	139(56)		1	1	
Practice to Covid-19 prevention						
Good	126(73.7)	45(26.3)		1.98(1.3,2.9)	1.8(1.2,2.8)	0.005*
Poor	271(58.5)	192(41.5)		1	1	

Factors that affect community practice towards Covid-19

In examining the community practice on the novel corona virus prevention practice, demographic characteristics of the participants were tested and a better practice were observed on employed participants, peoples who live together with five or more peoples; but younger aged participants showed poor practice. Good prevention practice also showed on participants who had good awareness and favorable perception on prevention measures. In this study, the odds of covid-19 prevention practice decreased by 60% AOR: 0.4, CI 95%: (0.23, 0.71). and 51% AOR: 0.49, CI 95%: (0.24, 0.9) among participants aged

less than 24 and in those between 25 and 35 years old respectively compared to those above 55 years' old. Employed participants were 3.72 times higher to have good covid-19 prevention practice compared to unemployed, and those who live together with five were 1.9 times more likely to have good practice compared to those who live alone. Both awareness and perception on covid-19 prevention measures were associated with practice. Those who had good awareness were 2.3, and those who had favorable perception were 1.9 times more likely to have good covid-19 prevention practice compared to those who had poor awareness and perception respectively (Table 4).

Table 4. Bivariate and multivariable Binary logistic regression analyses of socio-demographic factors associated that affect practice towards covid-19 prevention, Tigray, 2021.

Variable	Practice		COR (95%CI)	AOR (95% CI)	P- Value
	Good N (%)	Poor N (%)			
Sex					
Male	108(26.8)	295(73.2)	0.9(0.67,1.4)	1.17(0.7,1.8)	0.61
Female	63(27.3)	168(72.7)	1	1	
Age					
18-24	13(33.3)	26(66.7)	0.95(0.44,2.0)	0.4(0.23,0.71)	0.002*
25-35	58(21.9)	207(78.1)	0.53(0.33,0.8)	0.49(0.24,0.9)	0.048*
36-45	37(24.8)	112(75.2)	0.63(0.37,1.0)	0.99(0.43,2.2)	0.99
46-55	20(35.7)	36(64.3)	1.05(0.54,2.0)	0.99(0.36,2.6)	0.98
>56	43(34.4)	82(65.6)	1	1	
Marital status					
Single	89(27.1)	239(72.9)	0.62(0.21,1.7)	0.50(0.16,1.5)	0.32
Married	73(27.4)	193(72.6)	0.63(0.22,1.7)	0.47(0.14,1.5)	0.43
Divorced	3(12.5)	21(87.5)	0.23(0.04,1.1)	0.19(0.03,1.0)	0.07

Widow/separated	6(37.5)	10(62.5)	1	1	
Occupation					
House Wife	26(33.3)	52(66.7)	1	1	
Employee	92(26.5)	255(73.5)	0.72(0.42,1.2)	3.72(1.5,8.6)	0.004*
Privet business	37(26.2)	104(73.8)	0.71(.39,1.29)	1.74(0.8,3.8)	0.091
Others (Laborer, un employed)	16(23.5)	52(76.5)	0.61(0.29,1.2)	2.0(0.9,4.4)	0.054
Educational status					
Not educated	9(20)	36(80)	1	1	
Know read and write	11(28.9)	27(71.1)	1.6(0.59,4.4)	1.40(0.464,2)	0.608
Elementary	19(31.7)	41(68.3)	1.8(0.74,4.6)	1.8(0.6,5.1)	0.229
High school and above	132(26.9)	359(73.1)	1.4(0.69,3.1)	1.1(0.4,2.8)	0.704
Live together with					
Alone	7(14.9)	40(85.1)	1	1	
≤ five	121(28.1)	310(71.9)	2.2(0.97,5.1)	2.4(0.98,1.2)	0.052
5 or more people	43(27.6)	113(72.4)	2.1(0.90,5.2)	1.9 (1.06,6.6)	0.031*
Awareness to Covid-19 prevention					
Good	126(32.6)	260(67.4)	2.18(1.4,3.2)	2.32(1.5,3.5)	0.001*
Poor	45(18.1)	203(81.9)	1		
Perception on Covid-19					
Favorable	126(31.7)	271(68.3)	1.98(1.3,2.9)	1.85(1.2,2.8)	0.004*
Unfavorable	45(19)	192(81)	1	1	

Discussion

The novelty of Covid-19, along with its uncertainties, makes it critical for health authorities to plan appropriate strategies to prepare and manage the public. As far as to our concern, this is the first epidemiological survey aimed at assessing the KAP of communities within north Ethiopia towards the Covid-19 pandemic as well as identifying key areas of concerns and needs for optimal subnational and need based community intervention. It is therefore utmost importance that awareness and perception on prevention measures and community practices of the recommended guidelines be studied to guide these efforts.

The current study showed that, 61% of the community had good awareness and 63% had good perception on covid-19 prevention measures but only 27% implemented the recommended prevention practices. In the logistic regression analyses, significant difference in awareness, perception and practice was observed across educational level, occupation, family size, and age of participants.

In this community based study 61% of the participants showed good awareness on covid-19 infection prevention measures, and sign and symptoms of corona virus which is in line with a systematic review conducted on articles from Ethiopia, 61.7%(9)and a

study conducted in Syrian residence, 60%. However, the current study is lower than studies conducted in India 80.6%(17), Malaysia 80.5%(19), Nigeria 99.5%. This difference might be due to difference on the impact of covid-19 which was higher in countries like India. Other than this, since Tigray community was in intranet and major medias blackout, lack of information access might be a reason for decreased awareness in the study area. The awareness result is also lower than an online cross sectional studies in Ethiopia, 74.7%(20), study conducted among undergraduate students in Debre Berhan University 73.8%(21), and another systemic review result conducted among studies in Ethiopia 79.4%(22). This could be due to difference in the study population. Unlike to this community based study, the previously listed studies were conducted among professionals, only those who can access social media and other online platforms possibly people with a higher educational level. This might help them to have a higher awareness on the disease(4, 23, 24).

However, the current result is higher than online study conducted in Ethiopia 48.1%(25), in Dessie and Combolcha 56%(23), study conducted in Tigray

42.9%(24) and study conducted in Addis Ababa 37.2%(26). Most likely, this difference is due to the time of the study. These studies were conducted early at the inception of the disease when most of the communities were unaware how to prevent Covid-19 infection.

In this study, both governmental and nongovernmental employees doubled the probability of having good awareness on covid-19 prevention measures compared to those unemployed ones. This result supports the previous study findings which documents association of employment status and occupation strongly correlated with high awareness score(27-29). This could be due to the reason that, governmental and nongovernmental institutions are most likely to impose rules that force the implementation of the recommended prevention guidelines. Together with the possibility of having higher educational status in employed ones, those instructions might enhance their attention to the widely disseminated information. Whereas those unemployed and persons who work at self-owned private business couldn't have motivated that influence their awareness on the prevention measures.

The other variable that determines the awareness of participants was educational level. In this study, as the educational level increases, there is a significant increase with the odds of having good awareness on covid-19 prevention measures. This result has similarity with studies conducted in Iran(27), China(28), India(17), Sudan(29) north east Ethiopia(23), and Tigray(24). This could be due to the reason that, educational level and occupation were strong indicators of awareness regarding Covid-19 which postulates the combination of better access to information and high educational level leads to appropriate apprehension and comprehension of information and consequent to better awareness on Covid-19.

Tigray was among the regions which formulated ground restrictions and community mobilizations that enhance overall community awareness, perception and covid-19 prevention practice in Ethiopia. Nevertheless, the current study revealed only a modest perception, 63% on covid-19 prevention measures, risk and seriousness estimation, and perceived assertiveness of the recommended prevention guidelines was observed. This result is similar to studies conducted in

Syria, 61.25%(30), and another study conducted in northern Ethiopia, 67%(31). However, it is lower than studies conducted in India, 97.33%(17), Nigeria, 79.5%(32), even the mean score of systematic review 72.39%(9) and meta-analyses results conducted on articles from Ethiopia 73.7%(22). The underlying reason could be related to the currently existed quality of the Tigray health care system that has been seriously affected by the ongoing conflict. This could further deteriorate due to communication blackout and absence of ongoing behavioral interventions that could increase the community perception. Such results were observed in studies conducted among community affected by warlike Syria in which the community concern more relies on conflict related survival issues than concerns created by endemic and pandemic issues like Covid-19(30).

Mask use was among the miss perceived issues in the community. Opposing the recommendation and derived evidence and enforcement of the practice, 15.5% believed face mask unlikely to prevent the virus and those who wear it are fooled. This could be attributed to several factors: including inconsistency in the information between different sources such as WHO,

CDC, and FMOH that failed to publicize the importance of mask use reliably. Similar result was observed in other previous studies conducted in Malaysia(19) and Egypt(33).

Consistent to the awareness, compared to those not educated and unemployed, participants who did attend high school and above and employed in governmental and nongovernmental institutions showed more favorable perception on the Covid-19 prevention measures. This result was supported by studies conducted in Sudan(29), China(28), and the Kingdom of Saudi Arabia(34). This could be due to the fact that educational level determines access to information and comprehension ability. On the other hand, restrictions imposed by employers directly impact employee's behavior. Awareness on Covid-19 prevention measures is the other variable associated with perception. Participants who had good awareness showed a favorable perception. This reaffirms that better awareness enhances the perception. Similar levels of association between these variables were documented in a previous study on H1N1 pandemic(35).

The overall prevention practice in the current study is low, (27%) compared to relatively high awareness and good

perception of the participants. The magnitude is much lower than studies conducted in India 97.33%(17), Malaysia 83.1%(19), Syria 73%(30), in Addis Ababa 59.8%(25), a systematic review 52.8%(9), and a meta-analysis result on articles from Ethiopia 40.3%(22). Most of the respondent's result witness that they were not avoiding crowded places, church visits, greeting relatives, and wearing mask in crowded place. This could be due to different factors; following the conflict, community most likely disvalue the pandemic's impact due to access to sanitation materials such as hand washing facilities, facemasks, and enforcing social distancing in different facilities which are totally impractical in the study area.

Frequent hand washing and sanitization was the most practiced prevention activity. Almost three fourth participants' desirable to ask other peoples to frequently wash their hands or sanitize them by antiseptic. However, only 46.7% able to practice appropriate hand washing and frequent sanitization in the week before the survey. This result indicates that the community awareness and perception towards the prevention measure is much higher than their practice. This could be due to the

reason that, water and hand sanitizer access are limited this time in Tigray. In line with this, hand washing and frequent hand sanitization was the highest scored the recommended prevention activity. Similarly, though a wider gap was observed in the percent score, this practice was documented as the highly practiced prevention measure in a study conducted in Malaysia 87.8%(19), and several community based studies in Ethiopia(73-75%)(25, 36).

Following the crude information from China that determine older age as a risk for Covid-19 infection and the rigorousness, most countries and studies from different world regions were reporting a higher risk taking behavior among younger population (4, 20, 30). This evidence was revealed in the current study; youths and participants in mid-twenties and thirties had poor prevention practice compared to those older than 55 years age. This could be due to different factors; compared to late adult and elders, youngsters are more likely to practice risky activities in contrary to the imposed restrictions. Other than this, reports that contain a higher magnitude of disease severity and death among older case might lead youngsters to perceive themselves as less risky to the diseases.

Occupation was associated with the practice level. Governmental and nongovernmental employers showed a higher prevention practice than unemployed. This could be due to the reason that, institutions are more likely to adhere national and international recommended guidelines and enforce the servants to implement while they are in their compound. This could enrich their perception and help them to develop good practice. On the other hand, self-employed are less likely to have such strict adherence motivators that help them practice the prevention. This result was supported by previous studies(20, 26, 30).

Living alone was associated with poor prevention practice. In this study, those who live together with five or more people were more likely to have good practice as compared to those who live alone. This result is in line with other previous studies that documented number of family members as determinate factor to prevention practice(4, 20). This could be due to the reason that; living with someone you care determines risk taking behavior and those who live with other are less likely to have negligent practice that risk their beloved once life to the pandemic danger.

The most important thing is the association between awareness, perception and practice. In this study, both awareness and perception on covid-19 prevention measures were associated with practice. This study provides evidence on the positive and significant correlations between awareness-perception, awareness-practice, and perception-practices among the respondents. Previous studies also showed stronger relationships between awareness, perception and practice in the circle of infection prevention measure(19, 20, 28).

Conclusion

In conclusion, this study provides insights into Tigray's community awareness, perception, and practices towards Covid-19 prevention measures throughout the conflict context. To this end, Tigray community demonstrated a modest awareness and perception towards Covid-19 prevention measures. However, the modest awareness and perception has not been rendered to satisfactory practices. Notably, there is alarmingly poor practice regarding the Covid-19 pandemic prevention. Upper educational level and employed were independent predictors of good awareness and favorable perception. Older age, being employed and living together with increased family members

predicted good prevention practice. Though, a wider gap was existed between prevention practice and both awareness and perception, a strong positive correlation was observed among awareness, perception and practice of Covid-19 prevention strategies in the community.

Recommendation

This study presents a unique reference for pandemic cautious behavioral response to COVID-19 in a conflict time context. Understanding the current situation and focusing on the alarming poor prevention practice, both ministry of health and health bureau shall drive a special plan which incorporate considerations that substitute the unveiled health facilities, medias and other means of awareness creation and thereby improve the prevention practice towards COVID-19 pandemic. Besides, further investigations are required on impact of media access and how different sources of information affect respondents' awareness. Competing interest

The authors report no conflicts of interest in this work.

Acknowledgments

We are thankful to Ethiopian Ministry of health for funding the project. We also acknowledged our data collectors and the

study participants for giving us paramount

information.

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