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KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS COVID-19 AMONG ARBA MINCH TOWN, SOUTHERN ETHIOPIA.

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ABSTRACT

Background: Coronaviruses are a tremendous family of viruses that can be an etiologic agent to cause a variety of disease in humans, which can lead to complications ranging from mild to severe life-threatening conditions. In late December 2019, numerous patients with viral pneumonia were found to be related to the Huanan seafood market in Wuhan, in the Hubei province of China. Due to the rapid spread of COVID-19 infection globally, the World Health Organization (WHO) declared that COVID-19 infection as global pandemic disease on March 11, 2020. After two days, the first case was reported in Ethiopia.

Objectives: To assess the knowledge, attitude and practice towards COVID-19 infection in Arba Minch town, Southern Ethiopia.

Methods: A cross-sectional survey was carried out at Arba Minch town from March 08 to April 08, 2020. Data were collected using a pre-tested interviewer administered questionnaire technique and online survey. The knowledge questionnaire consisted of 15 questions regarding the transmission, clinical characteristics and prevention of COVID-19. Attitude and practice questionnaire consisted of 6 and 7 questions, respectively. Data were coded and entered in to SPSS-for windows version 24 for analysis. Bivariate logistic regression analysis was done to determine the presence and degree of association between KAP and socio-demographic variables. Odds Ratios (OR) with 95% confidence intervals was calculated. In addition, multivariate logistic regression analysis was applied for knowledge and statistical significance test was declared at P-value <0.05 and adjusted OR (AOR) with 95% CI.

Results: A total of 528 participants completed the survey questionnaire, of these, 392 (74.2%) were male. The mean (SD) of COVID-19 knowledge score was 11.48 (SD: 2.25, range: 1-15), suggesting an overall 76.53% $[(11.48/15) \times 100]$ correct rate. About 408(77.3%) of participants had confidence on WHO could win the battle against COVID-19. One hundred twelve (21.2%) of respondents were oppose the wearing of face masks. Among the study participants, 33.3% of respondents had at least one risk behaviour related to COVID-19 infection. Multivariate logistic regression showed that age group of≥ 40 years (AOR=13.2; 95%CI: 3.83, 45.64) (vs. ≤21 years) , marital status of married (vs. single) (AOR=0.35; 95%CI: 0.19-0.67), education levels of degree or higher (vs. primary school and below) (AOR=7.33; 95%CI: 2.2-24.23), and occupation status of government employed (vs. students) (AOR=0.24; 95%CI: 0.1-0.60) were significantly associated with knowledge of COVID-19. Gender (being male) and age (<20 years) are more likely to engage in risk-taking behaviors. Higher knowledge score was possessed positive attitude and proactive practice towards COVID-19.

Conclusion: The findings showed the majority of respondents had good knowledge, positive attitude, and less risky behaviour toward COVID-19, but there are some negative attitudes, and risky behaviour than expected. Especially, respondents had very reckless practices; going to a crowded place and not wearing a mask when leaving home.Health education programs aimed at improving COVID-19 knowledge are helpful to reduce risky behaviour and maintain appropriate practices.

Keywords*: Coronavirus, COVID-19 infection, Knowledge, Attitude, Practice*

1. INTRODUCTION

1.1.BACKGROUND DATA

Coronaviruses are a tremendous family of viruses that can be an etiologic agent to cause a variety of disease in humans, which can lead to complications ranging from mild to severe life threatening conditions. To mention some common cold, sever acute respiratory syndrome (SARS) and currently Covid-19 infection[1]. Corona viruses have been identified in several avian hosts[2, 3], as well as in different mammals including bats, camels, mice, dogs and cats. Novel mammalian corona viruses are now regularly identified, additionally an HKU2-related corona virus of bat origin was responsible for a fatal acute diarrheal syndrome in pigs in 2018 [4].

Among the different corona virus species that are responsible to cause pathologic condition in humans, most of the time they are accompanying with mild clinical manifestation, with two obvious exceptions: sever acute respiratory syndrome (SARS) coronavirus (SARS-CoV)[5], a novel beta coronavirus that occurred in Guangdong southern China, in November, 2002 [6], brought about eight thousand human infections and seven hundred seventy four mortalities in thirty seven different countries during 2002-03 [7], and Middle East respiratory syndrome (MERS) corona virus (MERS-CoV), which was first identified in Saudi Arabia in 2012[8], resulted 2494 definitely confirmed cases in laboratory examination, followed by 858 losses of life[9, 10].

In late December, 2019, numerous patients with viral pneumonia were found to be related with the Huanan sea food market in Wuhan, in the Hubei province of China, where a lots of non-aquatic animals like birds and rabbits were also available for sale before the occurrence of the disease. Then after, the etiologic agent for the outbreak were human infecting corona virus (2019-nCoV), was identified [11, 12].As of April 4 2020, globally WHO reported more than 1,268, 529 confirmed cases and 69,321 deaths. Amongst the reported cases, USA with 334,125 Confirmed cases and 9,557 deaths, Spain 131,646 confirmed cases and 12,641 deaths, Italy 128,948 confirmed cases and 15887 deaths respectively [13]. And as of April 18 2020, globally WHO reported more than 2,282, 330 confirmed cases and 156,359 deaths globally. Amongst the reported cases, USA with 713,239 Confirmed cases and 37,303 deaths, Spain 191,726 confirmed cases and 20,043 deaths, Italy 172,434 confirmed cases and 22,745 deaths respectively [13].

Because of a tremendous air transport and trade relation between Africa and the rest world including China and Europe [14]. Africa is at high risk for the introduction and spread of Novel coronavirus disease 2019 (COVID-19)[15].As of April 6 2020, amongst the cases of COVID-19, more than 9310 confirmed cases and 444 fatalities respectively [13]. And As of April 18 2020, amongst the cases of COVID-19, more than 21,079 confirmed cases and 1,034 fatalities respectively[13]. Amongst the reported cases Egypt with 2,844 confirmed cases and 205 deaths, South Africa 2,783 confirmed cases and 50 fatalities[13].

The social and economic impact of Covid-19 infection outbreak is perceptible. COVID-19 is a viral infectious disease that terrifies the whole population in the entire continent and disrupts community physical and mental health. It has threatened the political, economic and social stability of countries throughout the world, following this outbreak in different countries the economic growth, sense of security, health care system, trade relations, tourism, employment and global interactions were rigorously negatively affected in recent outbreak [16-18].

The outbreak of the novel corona virus (2019-n CoV) has been declared a public health emergency of international concern by WHO [19]. Due to the rapid spread of COVID-19 infection globally, the world health organization (WHO) declared that COVID-19 infection as global pandemic disease on March 11 2020[20].

Sever Acute Respiratory disease (SARS) and Middle East Respiratory Syndrome (MESRS) coronaviruses susceptibility seems to be associated with age, biological character and other health conditions, unlike that of the above mentioned disease conditions COVID-19 has been declared as a Public Health Emergency of International Concern by the WHO [19].

According to Ministry of Health of Ethiopia, as of April 5 2020, totally 1843 laboratory test conducted 43 cases are confirmed positive for COVID-19 and suspected number of people who are in contact with infected people are in isolation and quarantine [20]. And as of April 18 2020, totally 105 cases are confirmed positive and 3 deaths for COVID-19 and suspected number of people who are in contact with infected people are in isolation and quarantine [20].

Given the rapid spread of new coronavirus infectious disease and its impact on human health and wellbeing, the researchers from varies directions has investigated immediately about the new coronavirus type and enormous research articles from different view point have already been published. Hence our study aimed to provide the level of knowledge, attitude and practice on the cause, mode of transmission, clinical manifestation, preventive methods including the level of applicability of commands from the federal ministry of health and other concerned bodies, diagnostic methods and treatment processes of COVID-19 infection in Arba Minch Ethiopia. This research can deliver an essential facts for researches interrelated to this topics, additionally may support government and non-governmental organizations 'to make decision on schemes to control the recent COVID-19 infection at local, national and global level.

2. METHODS

2.1.Study Design and Setting

This cross-sectional survey was conducted from March 08 to April 08, 2020 at Arba Minch town.The total population of the town is estimated to be 100,355. The town is located 460km south of the national capital (Addis Ababa). Its elevation ranges from 1,200 metres above sea level at the northern end and 1,320 metres above sea level at the southern end. The town has an average temperature 30^{o}C and rainfall of 575mm. There are also two lakes; Lake Abaya at the East and Lake Chamo at the South East of the town.

2.2.Data Collection Procedure and Tools

Data were collected using a pre-tested interviewer administered questionnaire technique and online survey.Our first plan was to collect the data at the community level using questionnaires and it was started on March 6, 2020. However, after five days Ethiopia has confirmed the first coronavirus case on March 13. Consequently, we stopped collecting information at the community-based.Because it was not feasible to continue a community-based sampling survey during this special period, we decided to collect the data online.Therefore, the interviewer-administered questionnaire was changed into an online survey platform using Microsoft-office (forms.office.com). Relying on the Paramed Collage networks with people living in Arba Minch town and it's around the district, a three-page questionnaire was posted/reposted to moments and groups of their Telegram, WhatsApp, Facebookand email address.Thequestionnaire/ online survey contained a brief introduction on the background, the objective of the study, procedures, voluntary nature of participation,

declarations of anonymity and confidentiality. Persons who were aged 15 years or more, understood the content of the questionnaire (online survey), and agreed to participate in the study were instructed to complete the questionnaire via clicking the link. Although the questionnaire/ online survey was distributed by residents, we did not constrict our sample to Arba Minch residents only. Residents of other provinces were also eligible for this survey if they were willing to participate.

2.3.Measurements

The online survey/ questionnairewas adapted from different literature that was used for data collection purpose, the guidelines of the National Health Commission of the People's Republic of China for clinical and community management of COVID-19 and WHO guidelines[21-23]. The questionnaire consisted of two parts: socio-demographic characteristics and knowledge, attitude, and practice towards COVID-19. Socio-demographic variables included gender, age, place of residence, religion, marital status, education, occupation and monthly income; these variables were considered as independent variables.

The knowledgequestionnaire had 15 questions (**Table 3**): 4 regarding transmission routes (K1-K4), 9 regarding prevention and control (K5-K13), and 2 regarding clinical presentations (K14 and K15) of COVID-19. These questions were answered on a True/False basis with an additional "I don't know" option. Knowledge was one of the dependent variable: a correct answer was assigned 1 point and an incorrect/unknown answer was assigned 0 points. The total knowledge score ranged from 0 to 15. If the respondent answered more than the mean score (11.48), they were considered as having "good knowledge = 1" otherwise considered as "poor knowledge = 0" regarding COVID-19 transmission, prevention and. clinical presentations. The validation tests of the knowledge questionnaire showed that the Alpha Cron-bach was 0.81 in our sample, indicated acceptable internal consistency[24].

Attitudes towards COVID-19 were measured by 6 questions (A1-A6, **Table 4**). High-risk behaviour or practice was assessed using 7 item questionnaire (P1-P7, **Table 5**). Each of the dependent variable, attitude (6 items) and practice (7 items), had two possible values: 1= ("Yes, I always/most of time have this attitude/practice") or 0= "No, I some time/ occasionally/rarely have this attitude/practice".

2.4. Statistical Analysis

Data were coded and entered into SPSS-for windows version 24 for analysis. Frequency distribution tables were used to quantify socio-demographic variables and KAP toward COVID-19. Binary logistic regression analysis was done to determine the presence and degree of association between knowledge and socio-demographic variables. Odds Ratios (OR) with 95% confidence intervals was calculated. Variables having p-value less than 0.05 were treated as showed a statistically significant association with knowledge of COVID-19. Factors that show association in bivariate analysis and which has P-value less than 0.2 were included in the final model (Multivariable logistic regression) to identify factors associated with knowledge.The p-value of Hosmer-Lemeshow test of Goodness-of-fit was 0.81 (p-value >0.05), so this indicate that the model was fit. At the end, adjusted odds ratios (AOR) with 95% CI, variables having p-value less than 0.05 were treated as showed a statistically significant association with knowledge of COVID-19. Similarly, binary logistic regression analyseswereperformed to identify the main factors affecting respondent's practices (7 items) and attitudes (6 items) from among the socio-demographic variables and knowledge level (scored as a continuous variable).

2.5.Ethical Consideration

The Ethics Committee of Paramed Collage approved our study protocol and procedures of informed consent before the formal survey. Participants had to answer a yes-no question to confirm their willingness to participate voluntarily. After confirmation of the question, the participant was directed to complete the self-report questionnaire.

3. RESULTS

3.1.Socio-demographic Characteristics

The research was done before and after the coronavirus case confirmation in Ethiopia. During the community-based survey, we have collected information from 216 people. After Ethiopia confirmed its first case on March 13, 312 respondents participated in the online survey. Therefore, a total of 528 peoples participated in this study; of these 220 (41.7%) were in the age group 21-30 years and the mean (SD) age of the respondents were 28.47 (±8.91) ranging from 15 to 56 years and male constitute 392 (74.2%). Among the study participants, 472 (89.4%) were living in an urban area and the rest were rural area.

Three hundred twelve (59.1%) of the respondents were Orthodox by religion, followed by Protestant (25.8%). Two hundred ninety-six (56.1%) of the participants were not married and 196(37.1%) were married. Three hundred forty-eight (65.9%) held a bachelor's degree or above, 180(34.1%) engaged in governmental organizations and 204(38.6%) were students. The majority of participants had monthly income. The minimum and maximum monthly incomes were 1000.00 and 20,000 Birr, respectively. The mean (SD) monthly income of the respondents was 4310.27 (±5067.43) (**Table 1**).

Table 1. Demographic characteristics of participants, Arba Minch, Gammo Zone, Southern Ethiopia, 2020.

Characteristics		Frequency	%
Sex	Male	392	74.2
	Female	136	25.8
Age-group (years)	≤20	112	21.2
	21-30	220	41.7
	31-40	156	29.5
	≥41	40	7.6
Place of Residence	Urban	472	89.4
	Rural	56	10.6
Religion	Orthodox	312	59.1
	Muslim	56	10.6
	Protestant	136	25.8
	Others*	24	4.6
Marital Status	Single	296	56.1
	Married	196	37.1
	Divorced	24	4.5
	Widowed	8	1.5
	Separated	4	0.5
Education	Primary School and below	28	5.3
	Secondary School	116	22.0
	Diploma	20	6.8
	Degree and above	348	65.9
Occupation	Students	204	38.6
	Government Employed	180	34.1
	Private Employed	72	13.6
	Merchant	28	5.3
	Unemployed	16	3.1
	Others**	28	5.3
Monthly Income	No-income	232	43.9
	≤2500	36	6.8
	2501-5000	56	10.6
	5001-7500	68	12.9
	≥7501	136	25.8

*(Catholic, Adventist, Apostles, No-religion) **(Retired, Physical labour)

3.2.Source of information about COVID-19

All of the study participants have information about COVID-19, and they have heard about it through one or more source information such as TV/Radio, Social-Media, their family members and friends. TV/Radio has a role of 424(80.3%) and followed by a social-media 372(70.5%). Among the respondents, 492(93.2%) were shared the obtained information for their family members 76(15.45%), friends 104(21.14%), and both of them 296(60.16%).

Table 2. Source of information about COVID-19, Arba Minch, Southern Ethiopia, 2020.

Characteristics	Sources	Frequency	%
Number of Participants heard about COVID-19: 528(100%)*			
Source/s of information	TV/Radio	424	80.3
	Social Media	372	70.5
	Friends	220	41.7
	Family members	164	31.1
	Reading Journals	4	0.75
Shared the obtained information to others person: 492(93.2%)*			
Shared the information for:	Only Family members	76	15.45
	Only Friends	104	21.14
	Both Family and Friends	296	60.16
	Family, Friends, and Community	16	3.25

* More than one answer is possible

3.3.Knowledge about COVID-19 transmission, prevention, and clinical presentations

The correct answer rates of the 15 questions on the COVID-19 knowledge questionnaire were 28.8-93.2% (**Table 3**). The mean and standard deviation (SD)of COVID-19 knowledge score was 11.48 (SD: 2.25, range: 1-15), suggesting an overall 76.53% $[(11.48/15) \times 100]$ correct rate on this knowledge test.

Table 3. Knowledge about COVID-19 transmission, prevention and clinical presentations, Arba Minch, Southern Ethiopia, 2020.

Questions		Correct rate N(%)*
K1	Eating or contacting wild animals would result in the infection by the COVID-19 virus.	344(65.2)
K2	Persons with COVID-19 cannot infect the virus to others when a fever is not present.	324(61.4)
K3	The COVID-19 infection spreads via respiratory droplets of infected individuals.	468(88.6)
K4	Smokers and tobacco users are at higher risk of COVID-19	456(86.4)

	infection.	
K5	Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	492(93.2)
K6	Ordinary residents are advised to wear face-masks to prevent COVID-19 infection.	376(71.2)
K7	Ordinary residents are advised to wear glove to prevent COVID-19 infection.	112(28.8)
K8	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	396(75.0)
K9	Individuals should avoid going to crowded places such as train stations and avoid taking public transportations.	472(89.4)
K10	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days.	484(91.7)
K11	Wash your hands often with soap and water is advisable especially after you have been in a public place, or after blowing your nose, coughing, or sneezing.	472(89.4)
K12	Put distance between yourself and other people is important if COVID-19 is spreading in your community.	472(89.4)
K13	To prevent the infection by COVID-19, you should avoid touching your eyes, nose, and mouth with unwashed hands.	480(90.9)
K14	Not all persons infected with COVID-19 virus will develop severe complications. Only those who are elderly, have chronic illnesses, and obese are more likely to be severe complication.	264(50.0)
K15	Currently, there is no effective treatment for COVID-19 infection, but early symptomatic and supportive treatment can help most patients to recover from the infection.	452(85.6)

*Number and percentage

3.4.Attitude towards COVID-19 infection

Table 4 shows that,432 (81.8%) of the respondents were agreed on the successful control of the virus. About 408(77.3%) of participantshad confidence in the leaders/WHO could win the battle against COVID-19. One hundred twelve (21.2%) of respondents opposed the wearing of face masks.

Table 4. Attitude towards COVID-19 infection, Arba Minch, Southern Ethiopia, 2020.

Questions		**Options**	
		Yes N(%)*	**No N(%)**
A1	Do you agree that COVID-19 will finally be successfully controlled?	432 (81.8)	96 (18.1)
A2	Do you have confidence that world leaders (WHO) can win the battle against the COVID-19 virus?	408 (77.3)	120 (22.7)
A3	Do you think that the cause of Covid-19 is spiritual/ is it happened because of our sin?	272 (51.5)	256 (48.5)
A4	Didn't you generally oppose the wearing of face mask?	396 (75.0)	152 (28.8)

A5	Information about the coronavirus seems to spread as fast as the virus itself. So, are you negatively affected by the news you hear about COVID-19 infection?	276 (52.3)	252 (47.7)
A6	Do you think that infected person can cure from the COVID-19 infection with traditional medicines?	252 (47.7)	276 (52.3)

*Number and percentage

3.5.Practices towards COVID19 infection

Among the study participants, 33.3% of respondents had at least one risk behaviour related to COVID-19 infection. Two hundred sixteen (40.9%) of participants gone crowded place and 336(63.3%) were didn't used face-mask when leaving their home. Three hundred ninety-six (75.0%) respondents were used sterilizers before and after touching inanimate object like money, after being in contact with ATM (**Table 5**).

Table 5. Practices towards COVID-19 infection, Arba Minch, Southern Ethiopia, 2020.

Questions		**Options**	
		Yes N (%)	**No N (%)**
P1	In recent days, have you restricted going to any crowded place?	304 (57.6)	224 (42.4)
P2	In recent days, have you worn a mask when leaving home?	176 (33.3)	352 (66.3)
P3	Have you wash your hands often with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, or sneezing?	436 (82.6)	92 (17.4)
P4	If soap and water are not readily available, are youapplyinga hand sanitizer that contains at least 60% alcohol**?**	408 (77.3)	120 (22.7)
P5	Do you use sterilizers before and after touching inanimate object like money, after being in contact with ATM etc.?	396 (75.0)	132 (25.0)
P6	Do you apply if the government announce stay-at-home order?	384 (72.7)	144 (27.3)
P7	Didn't you touch your nose and mouth frequently without washing your hand?	352 (66.7)	176 (33.3)

3.6.Factors Associated with Knowledge on COVID-19 Infection

By applying binary logistic regression analyses; age (in year), marital status, education level, and occupational status were the factors found to be significantly associated with knowledge about transmission, prevention and clinical

presentations towards COVID-19. Therefore, these variables were included in the final model (multivariate logistic regression). Also, a variable sex was included in the final model because of its p-value <0.2.

Multivariate logistic regression showed that age group of 21-30 years (AOR=4.14; 95%CI: 2.13-8.03), 31-40 years (AOR=11.9; 95%CI: 4.93-28.62), and ⩾40 years (AOR=13.2; 95%CI: 3.83, 45.64) (vs. ≤21 years) , marital status of married (vs. single) (AOR=0.35; 95%CI: 0.19-0.67), educationlevels of degree orhigher (vs. primary school and below) (AOR=7.33; 95%CI: 2.2-24.23), and occupation status of government employed (vs. students) (AOR=0.24; 95%CI: 0.1-0.60) were significantly associated with knowledge of COVID-19 (**Table 6**).

Table 6. Multivariable analysis between socio-demographic variables and Knowledge about COVID-19 transmission, prevention and clinical presentations, Arba Minch, Southern Ethiopia, 2020.

	Knowledge about COVID-19				
Explanatory Variables	**Poor (0)**	**Good (1)**	**OR (95% CI)**		
	N(%)	**N(%)**	**Crude**	**Adjusted**	**P-value**
Sex					
Male	148(71.2)	244(76.2)	1.31(0.88-1.93)	1.02(0.62-1.69)	**0.93**
Female	60(28.8)	76(23.8)	1	1	
Age					

≤20	64(30.8)	48(15.0)	1	1	
21-30	80(38.5)	140(43.8)	**2.33(1.47-**	**4.14(2.13-**	**0.00**
31-40	40(19.2)	116(36.2)	**3.71)**	**8.03)**	**0.00**
⩾40	24(11.5)	16(5.0)	**3.87(2.30-**	**11.9(4.93-**	**0.00**
			6.51)	**28.62)**	
			0.89(0.43-	**13.2(3.83-**	
			1.85)	**45.64)**	
Marital Status					
Single	100(48.1)	196(61.3)	1	1	
Married	80(38.5)	116(36.2)	0.74(0.51-	**0.35(0.19-**	**0.001**
Others*	28(13.5)	8(2.5)	1.01)	**0.67)**	**0.000**
			0.15(0.06-	**0.05(0.01-**	
			0.33)	**0.17)**	
Education					
Primary	24(11.5)	4(1.20)	1	1	
School/below	68(32.7)	48(15.0)	**4.24(1.38-**	1.22(0.35-	0.75
Secondary School	12(5.8)	24(7.5)	**12.99)**	4.22)	**0.003**
Diploma	104(50.0)	244(76.2)	**12.0(3.38-**	**8.34(2.08-**	**0.001**
Degree and above			**42.52)**	**33.46)**	
			14.1(4.77-	**7.33(2.2-**	
			41.58)	**24.23)**	
Occupation					
Students	80(38.5)	124(38.8)	1	1	
Unemployed	16(7.7)	12(3.8)	0.48(0.22-	**0.27(0.08-**	**0.037**
Government	60(28.8)	120(37.5)	1.08)	**0.92)**	**0.002**
Employed	20(9.6)	52(16.2)	1.29(0.85-	**0.24(0.1-0.60)**	0.169
Private Employed	20(9.6)	8(2.5)	1.96)	0.48(0.17-	**0.000**
Merchant	12(5.8)	4(1.2)	1.68(0.93-	1.37)	**0.010**
Others**			3.02)	**0.07(0.02-**	
			0.26(0.11-	**0.23)**	
			0.61)	**0.12(0.025-**	
			0.22(0.07-	**0.61)**	
			0.70)		

*(Divorced, Widowed, and Separated); **(Retired, Physical labour); Bold: P-value < 0.05

3.7.Factors Associated with Attitude on COVID-19 Infection

Bivariate logistic regression analysis showed that age group of 31-40 years (OR=0.47; 95%CI: 0.23-0.95) and ≥40 years (OR=0.28; 95%CI: 0.11, 0.69) (vs. ≤21 years), urban residents (OR=1.96; 95%CI: 1.05-3.67), and COVID-19 knowledge score (OR: 1.13; 95%CI: 1.03-1.24) were significantly associated with the successfully controlled of COVID-19 (A1). Educational levels of degree or higher (vs. primary school and below) (OR=3.01; 95%CI: 1.41-6.83), government employed (vs. students) (OR=0.46 95%CI: 0.28-0.75), urban residence (vs. rural) (OR=2.07; CI: 1.15-3.73) were significantly associated with confidence of winning the battle against the COVID-19 virus (A2). Sex, age, marital status, occupation, and residence were significantly associated with the think that the cause of COVID-19 is spiritual/ is it happened because of sin (A3). Age, marital status, education, occupation, and knowledge on COVID-19 were statistically associated with no oppose the wearing of face mask (A4). Age, marital status, and occupation were significantly associated with negatively affected because hearing news about COVID-19 infection (A5). Marital status, occupation, and residence were associated with the belief of traditional medicines(A6) (**Table 7**).

3.8.Factors Associated with Practice on COVID-19 Infection

Female gender (OR=3.12; 95%CI: 2.01-4.86) (vs. male), age group of ≥40 years (OR=0.24; 95%CI: 0.11, 0.52) (vs. ≤21 years), marital status of married (OR=0.42; 95%CI: 0.29-0.61) (vs. single), government employed (OR=0.33; 95%CI: 0.27-0.51) and private employed (OR=0.38; 95%CI: 0.22-0.66) (vs. students), and urban residence (OR=0.19; 95%CI: 0.09-0.43) (vs. rural) were significantly associated with restricted going to any crowded place (P1). Age, occupation, and place of residence were statistically associated with wearing a mask outside (P2). Age, education level, and occupation were significantly associated with a practice of hand washing often with soap and water for at least 20 seconds (P3). All explanatory variables were statistically associated with a hand sanitizer used that contains at least 60% alcohol when soap and water are not available (P4). Age, marital status, and educational level were significantly associated with used sterilizers before and after touching inanimate object like money, after being in contact with ATM (P5). Marital status, education level, and occupation were significantly associated with applying if the government announce stay-at-home order (P6) and not touching nose and mouth frequently without washing your hand (P7) respectively. Knowledge score about COVID-19 was statistically associated with P3, P4, P6, and P7 respectively (**Table 8**).

Table 7. Bivariateanalysis between socio-demographic variables and Attitude towards COVID-19, Arba Minch, Southern Ethiopia, 2020.

Explanatory Variables	Attitudes towards COVID-19, OR (95% CI)					
	A1	A2	A3	A4	A5	A6
Sex						
Male	1	1	1	1	1	1
Female	0.81(0.49-1.32)	2.71(1.54-4.77)	**1.48(1.01-2.21)**	1.01(0.71-1.75)	0.88(0.59-1.31)	1.45(0.92-2.27)
Age						
≤20	1	1	1	1	1	1
21-30	0.54(0.27-1.08)	0.87(0.48-1.56)	**1.75(1.01-2.78)**	**3.00(1.82-4.94)**	1.38(0.87-2.19)	1.60(0.95-2.71)
31-40	**0.47(0.23-0.95)**	0.55(0.31-1.01)	0.63(0.38-1.02)	**4.13(2.32-7.32)**	1.56(0.95-2.54)	0.64(0.38-1.08)
≥40	**0.28(0.11-0.69)**	0.51(0.22-1.67)	0.67(0.32-1.39)	1.13(0.54-2.35)	**5.33(2.6-12.61)**	0.60(0.28-1.28)
Marital Status						
Single	1	1	1	1	1	1
Married	1.09(0.67-1.77)	0.72(0.47-1.11)	**1.62(1.12-2.33)**	**0.53(0.35-0.81)**	**2.26(1.56-3.27)**	**0.56(0.376-0.84)**
Others*	**0.43(0.20-0.97)**	**0.29(0.14-0.59)**	0.89(0.46-1.79)	**0.29(0.14-0.59)**	**2.63(1.27-5.48)**	**0.37(0.18-0.76)**
Education						
Primary	1	1	1	1	1	1

School/below Secondary School	1.26(0.49-3.17)	2.36(0.99-5.58)	1.43(0.61-3.28)	1.05(0.46-2.45)	1.64(0.71-3.78)	0.54(0.167-1.64)
Diploma	1.40(0.45-4.36)	1.50(0.54-4.16)	2.67(0.96-7.39)	0.60(0.22-1.63)	1.07(0.39-2.89)	26(0.01-10.09)
Degree and above	2.28(0.95-5.44)	**3.01(1.41-6.83)**	1.36(0.63-2.97)	**4.27(1.91-9.54)**	1.49(0.69-3.26)	**0.32(0.11-0.93)**
Occupation						
Students	1	1	1	1	1	1
Unemployed	**0.25(0.10-0.57)**	**0.25(0.11-0.57)**	1.28(0.58-2.85)	**0.41(0.18-0.93)**	1.76(0.79-3.91)	**0.18(0.08-0.42)**
Government Employed	1.01(0.58-1.75)	**0.46(0.28-0.75)**	0.92(0.62-1.37)	1.42(0.86-2.35)	1.38(0.92-2.06)	**0.33(0.21-0.53)**
Private Employed	1.49(0.65-3.40)	0.65(0.33-1.28)	1.51(0.87-2.61)	1.08(0.57-2.05)	**3.43(1.91-6.16)**	1.95(0.87-4.41)
Merchant	**0.25(0.11-0.57)**	0.47(0.19-1.15)	**2.41(1.01-5.71)**	**0.12(0.05-0.31)**	**7.91(2.65-23.6)**	0.61(0.25-1.49)
Residence						
Urban	**1.96(1.05-3.67)**	**2.07(1.15-3.73)**	**2.06(1.16-3.67)**	1.79(0.99-3.21)	0.58(0.32-1.02)	**0.17(0.06-0.47)**
Rural	1	1	1	1	1	1
Knowledge on COVID-19	**1.13(1.03-1.24)**	1.07(0.98-1.17)	0.96(0.89-1.04)	**1.55(1.39-1.72)**	0.99(0.92-1.08)	1.03(0.94-1.011)

*(Divorced, Widowed, and Separated); Bold: P-value < 0.05

Table 8. Bivariateanalysis between socio-demographic variables and Practice towards COVID-19, Arba Minch, Southern Ethiopia, 2020.

Explanatory Variables	Practice towards COVID-19, OR (95% CI)						
	P1	P2	P3	P4	P5	P6	P7
Sex							
Male	1	1	1	1	1	1	1
Female	**3.12(2.01-4.86)**	0.94(0.62-1.43)	0.98(0.59-1.64)	**3.93(2.09-7.41)**	1.11(0.71-1.76)	1.06(0.68-1.64)	0.75(0.51-1.12)
Age							
≤20	1	1	1	1	1	1	1
21-30	0.89(0.56-1.44)	1.52(0.94-2.45)	**2.72(1.49-4.97)**	1.29(0.77-2.16)	**1.71(1.02-2.83)**	1.17(0.71-1.95)	1.58(0.98-2.54)
31-40	0.65(0.39-1.07)	**0.46(0.26-0.82)**	**1.83(1.00-3.37)**	**2.72(1.46-5.07)**	**1.84(1.05-3.21)**	0.90(0.53-1.53)	1.46(0.88-2.42)
≥40	**0.24(0.11-0.52)**	**2.11(1.01-4.41)**	0.50(0.23-1.07)	0.60(0.28-1.28)	0.71(0.34-1.51)	1.60(0.67-3.84)	0.65(0.31-1.34)
Marital Status							
Single	1	1	1	1	1	1	1
Married	**0.42(0.29-0.61)**	0.81(0.55-1.21)	0.81(0.48-1.33)	1.07(0.69-1.68)	**3.03(1.85-4.97)**	**0.66(0.45-0.99)**	**0.63(0.43-0.92)**
Others*	0.64(0.32-1.28)	0.92(0.44-1.92)	**0.13(0.06-0.26)**	**0.36(0.17-0.71)**	**0.34(0.17-0.68)**	1.13(0.49-2.58)	0.49(0.26-1.01)
Education							
Primary	1		1	1	1	1	1

School/below	0.92(0.40-	-	**9.58(3.76-**	2.18(0.95-	**2.53(1.09-**	**4.19(1.77-9.91)**	**15.8(5.07-**
Secondary School	2.12)	-	**24.4)**	5.04)	**5.87)**	2.67(0.96-7.39)	**48.96)**
Diploma	0.60(0.22-	-	**20.0(5.32-**	**10.7(2.96-**	21(0.001-	**3.94(1.79-8.65)**	**12.0(3.38-**
Degree and above	1.63)		**75.2)**	**38.4)**	1.01)		**42.52)**
	1.14(0.51-		**17.3(7.17-**	**6.95(3.12-**	**4.77(2.17-**		**13.3(4.52-**
	2.43)		**41.6)**	**15.5)**	**10.5)**		**39.36)**
Occupation							
Students	1	1	1	1	1	1	1
Unemployed	0.15(0.06-	**2.67(1.21-**	**0.21(0.09-**	0.45(0.20-	0.95(0.39-	0.69(0.28-1.67)	2.05(0.68-
Government	3.63)	**5.95)**	**0.49)**	1.03)	2.27)	**0.61(0.39-0.96)**	6.19)
Employed	**0.33(0.27-**	0.73(0.47-	0.86(0.49-	1.19(0.74-	0.75(0.49-	**0.55(0.31-0.99)**	**0.47(0.31-**
Private Employed	**0.51)**	1.13)	1.52)	0.19)	1.17)	0.69(0.28-1.66)	**0.72)**
Merchant	**0.38(0.22-**	**2.0(1.16-3.45)**	2.71(0.91-	**5.8(2.02-**	61.0(0.01-		**0.54(0.31-**
	0.66)	0.80(0.34-	7.99)	**16.73)**	1.01)		**0.95)**
	0.51(0.23-	1.91)	**0.21(0.09-**	0.86(0.35-	2.27(0.75-		2.05(0.68-
	1.13)		**0.49)**	2.06)	6.84)		6.19)
Residence							
Urban	**0.19(0.09-**	**0.33(0.19-**	1.34(0.68-	**2.94(1.65-**	1.79(0.99-	0.70(0.36-1.37)	0.70(0.36-
Rural	**0.43)**	**0.58)**	2.64)	**5.22)**	3.21)	1	1.37)
	1	1	1	1	1		1
Knowledge on COVID-19	0.01(0.01- 1.01)	0.95(0.87- 1.02)	**1.46(1.32- 1.62)**	**1.29(1.18- 1.41)**	1.09(1.00- 1.18)	**1.18(1.09-1.28)**	**1.28(1.18- 1.39)**

*(Divorced, Widowed, and Separated); Bold: P-value<0.05

4. DISCUSSION

To the best of our knowledge, this is the first study in Arba Minch examining the KAP towards COVID-19 among Arba Minch town residents. In this study, most of the respondents were heard information from the television /radio about COVID-19 related issues (80.3%) and followed by social media (70.5%). Almost half of the participants (52.3%) got them a negative impact because they have heard repeated news about the COVID-19 infection.

Information about the COVID-19 seems to spread as fast as the virus itself and social media have a great role to deliver health-related information's to the community, but fake news is a challenge, a lot of misinformation being shared and spreads around coronavirus treatments in different countries[25].In the UK alone, nearly half of all adults have been exposed to false claims or misleading information online about the virus, 35% have seen claims that drinking more water can help flush out the disease, for example, while around a quarter has seen advice suggesting the infection can be treated by gargling salt water - both of which have been rubbished by the WHOand contradict UK public health guidelines[26]. Currently, Facebook notifies users who interact with COVID-19 hoaxes, and posts with harmful misinformation about the novel coronavirus were removed by moderators[27].Therefore, the news of the COVID-19 should not be overstated or understated and the government should be informed to the citizens with reliable sources of news and health information on COVID-19[25].

Of the respondents, 76.53% demonstrated sufficient knowledge of COVID-19, indicating that most respondents are knowledgeable about the virus. However, it is lowerthan the study conducted in China(90.0%)[23]. This might be due to the variations of health information seeking behaviours among these countries. Knowledge is a prerequisite for establishing prevention beliefs, forming positive attitudes, and promoting positive behaviours, and individuals' cognition and attitudes towards disease affect the effectiveness of their coping strategies and behaviours to a certain extent [28].

Smokers and tobacco users are at higher risk of COVID-19 infection. In this study, few respondents (13.4%) were not aware of this risk. Smokers are likely to be more vulnerable to COVID-19 as the act of smoking means that fingers (and possibly contaminated cigarettes) are in contact with lips which increases the possibility of transmission of the virus from hand

to mouth. Smokers may also already have lung disease or reduced lung capacity which would greatly increase the risk of serious illness[29].

Among socio-demographic variables, age was found to be significantly associated with COVID-19 knowledge. Respondents aged above 40 years and 30-40 age group were 13 and 11 times more likely to be knowledgeable than respondents aged below 20 years respectively.These findings are supported by the study conducted on European citizens use of e-health servicesindicated that most active health users are the 30-to-44 age group[30]. Adolescents and young people can be an important resource in mitigating risks, and community outreach in this crisis.Young people exposed to COVID-19 are as likely as old people to become infected and contagious[31]. They should therefore strictly follow national guidelines around screening, testing, containment and care and practice social distancing[31]. Therefore, attention should be given to inform and support adolescents and young people in risk communication and virtual community engagement.

The vast majority of the participants also held an optimistic attitude towards the COVID-19 epidemic: 81.8% believed that COVID-19 will finally be successfully controlled, and 77.3% had confidence thatworld leaders/WHO can win the battle against the virus. A study conducted in China reported that90.8% of respondents have full faith that the disease can be controlled and 97.1% of respondents are confident that the government of China will control the disease[23].These figures are higher than our findings on the rates of final success and confidence of winning in the battle against COVID-19. The attitude of the respondents could be related to the unprecedented COVID-19 control measures such as transport limits throughout Ethiopia, Amhara region declared stay-at-home order in Bahir Dar city, and the closure of schools and universities, which enhance people's confidence in winning the battle against the virus. Secondly, the good knowledge about COVID-19 among the respondents can also explain this phenomenon, because as shown by results of bivariate analyses, higher COVID-19 scores were significantly associated with more likelihood of "yes" answers to question A1.Also, respondents have good knowledge score about COVID-19 were less likely to oppose the wearing of face mask than who have poor knowledge score.People living in urban resident had a positive attitude towardsthe rates of final success and confidence of winning in the battle against COVID-19 than who are living in rural resident. Therefore, the

local administration should focus on and encourage access to information for people in rural areas.

Female participants were about more likely to think that the cause of COVID-19 is spiritual than the male respondents. Almost half of the respondents (51.5%) were believed that the cause of COVID-19 pandemic is spiritual, and it emerged due to sin. Religion in Ethiopia consists of a number of faiths and more than 96% of the population have a religion[32].According to theological context: the Christian belief of traces all evil, disease and suffering to the original fall of our first parents, as a result, disorders of the body and soul - such as threatening viruses - emerged and re-emerge throughout history; the human family suffers from these evils[33].Recently, the Ethiopian Religious Council declares a month-long national prayer as the Coronavirus epidemic started to take away lives in the country, and it started broadcasting live TV [34]. Besides leading praying on TV channels, religious leaders should be teaching the public/ believers by interacting with faith and science on the means of preventing the pandemic. The government, therefore, should cooperate with the patriarchs (Fathers of faith) to educate the public on ways to prevent the transmission of the virus.

A study conducted in Hubei, China showed that 96.4% of residents didn't go crowded places and 98% wear masks when leaving homes during the rapid rise period of the COVID-19 outbreak[23]. In our study, the practices of respondents were very reckless: nearly all avoided crowded places (40.9%) and wore masks when leaving the homerecently (33.3%).Thus, we found that these results were very low as compared to a study reported in China[23]. These potentially risky behaviors were related to male gender (P1), age greater than 40 years for (P1) and less than 20 years for (P2), occupation of "employed" for (P1) and "students" for (P2) , marital status of "married" for (P1), and urban residents (P1). As suggested by findings from previous studies regarding age and gender patterns of risk-taking behaviors [35-37], men and late adolescents are more likely to engage in risk-taking behaviors. In line with these previous findings, we found significant association between male gender and potentially dangerous practices towards COVID-19 in this study. The significantly higher risk of going to a crowded place among students could be ascribed to their young age. The significantly higher risk of not wearing a mask when leaving homes may be attributed to the less serious situation of the COVID-19 epidemic. In addition, these reckless preventive practices could be primarily attributed to the very low prevention and control measures implemented by local governments such as challenges of banning public gatherings.Second, it could be the lack of

motivation of the residents' on practice towards COVID-19, therefore, everyone should focus on implementing these practice to protecting himself and his family and the country from the pandemic.

However, 82.6% of study participants washed their hands frequently with soap and water for at least 20 seconds especially after who had been in a public place, or after blowing nose, coughing, or sneezing.This potentially good practice was related to female gender, age 31-40 years, occupation of "private employed", marital status of "single" for (P1), urban residents, and good knowledge score on COVID-19.

On April 8, the Ethiopian government declared a state of emergency over coronavirus[38], but the total lockdown (stay at home order) not included.If the government announce stay-at-home order, 72.7% of the study participants have willing to apply it.Unfortunately, the present study still showed that 37.3% of respondents were didn't decided to accept the order.Stay-at-home order has the advantage to curb the spread of the virus, but it has a challenge on developed and developing countries[39, 40].

In this study, the higher COVID-19 knowledge scores were found to be significantly associated with a lower likelihood of negative attitudes (A1and A4) and potentially dangerous practices towards COVID-19 epidemic (P3, P4, P6, and P7). These findings clearly indicate the importance of improving residents' COVID-19 knowledge via health education, which may also result in improvements in their attitudes and practices towards COVID-19. Our findings of the demographic factors associated with KAP towards COVID-19 are generally consistent with previous studies on SARS in 2003[41, 42].

This is the first study in Ethiopia, but the study had some limitations in interpreting the results because COVID-19 is a novel coronavirus and no research has been studied to compare. The study samples were collected at Arba Minch town, and no sampling technique used. Therefore, it was difficult to generalize results across the general population. Future studies could estimate the knowledge, attitude, and practice of the citizens on a larger scale to be able to design appropriate interventions on a national level.

5. CONCLUSIONS

The findings showed the majority of respondents had good knowledge, positive attitude, and less risky behaviour toward COVID-19, but there are some negative attitudes, and risky behaviour than expected. Especially, respondents had very reckless practices; going to a crowded place and not wearing a mask when leaving home. Among socio-demographic variables, age (>40 years) and education level (degree and above) were major contributing factors forgood knowledge towards COVID-19. Gender (being male) and age (<20 years) are more likely to engage in risk-taking behaviors. Higher knowledge score was possessed positive attitude and proactive practice towards COVID-19.

6. RECOMMENDATIONS

Based on the finding of the study the following measures are recommended:

6.1.For local governments, health professional, religion leaders:

- The local administration should focus on and encourage access to information for people in rural areas.
- The health education programs should be continued in uncompromising and intensified way both in rural and urban community.
- The Federal Ministry of Health and local should uphold COVID-19 infection related facts evidences about Knowledge, attitude and practice on the mode of transmission, methods of prevention and the actions taken while some one is infected or suspected, especially via TV/radio and social Media.
- Religious leaders should be teaching the believers by interacting with faith and science on the means of preventing the pandemic.

6.2.For Individuals:

- Every individual should apply and followthe government's (Federal Ministry of Health) directions to control the distribution of the pandemic.

6.3.For Researchers:

- Further study on KAP toward COVID-19 and its associated factors with multiple measurements is needed to expand upon and resolve these issues.

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Competing Interests

The authors declare that they have no competing interest.

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