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Original Article

Knowledge, attitude and practice of patients with chronic diseases towards COVID-19 pandemic in Dessie town hospitals, Northeast Ethiopia

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ABSTRACT

Background and aims: Corona virus disease-19 first detected in China, December 2019. The government of Ethiopia takes preventive measures but the number of peoples infected with COVID-19 has been increased. Control of the pandemic requires changing of knowledge, attitude and practice of people. Hence, the objective of this study was to assess chronic disease patients' knowledge, attitude and practice towards COVID-19 pandemic.
Methods: Institution based cross-sectional study was done among 413 chronic disease patients from July 20 to August 5, 2020 in Dessie town hospitals. Multinomial logistic regression analysis was used and significant association declared at p-value of <0.05.
Results: From the total participants 34.6%, 81.4% and 40.7% had good knowledge, attitude and practice while 35.1%, 12.1% and 24.7% had moderate knowledge, attitude and practice towards COVID-19 pandemic, respectively. In multinomial logistic regression young age, urban residency, attainment of secondary education and presence of additional co-morbidity were predictors of moderate knowledge whereas urban residency, not attended formal education and presence of additional co-morbidity were predictors of good knowledge about COVID-19. Household family size and presence of additional co-morbidity were factors significantly associated with moderate practice of COVID-19 prevention methods. Furthermore, male sex, household family size, knowledge of COVID-19 and attitude towards COVID-19 were factors significantly associated with good practice of COVID-19 prevention methods.
Conclusion: Significant number of chronic disease patients had poor knowledge and practice towards COVID-19. Therefore, government, health professionals, Medias, researchers and health institution should do to improve the gaps of chronic diseases patients.

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1. Introduction

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is the etiology of coronavirus disease 2019 (COVID-19) first reported in China, Wuhan city in December 2019 and since then has spread to many countries of the world which led the World Health Organization (WHO) to announce it as a worldwide pandemic on 11th of March 2020 [1].

COVID-19 pandemic is a respiratory tract disease that causes fever, cough, fatigue, sore throat, headache, shortness of breath and chills. Shortness of breath or anorexia was a common complain among patients requiring intensive care unit. During hospitalization 89% of patients experienced a fever while only 44% were febrile at the time of admission [2–4].

COVID -19 disease prognosis ranges from mild symptom to severe manifestations including acute respiratory distress syndrome (ARDS), disseminated intravascular coagulation (DIC), septic shock and acute renal failure. SARS-CoV-2 infection more severe in elderly persons and patients with comorbidities like chronic lung diseases, overweight persons, liver disease, diabetes mellitus, chronic kidney disease, under immunosuppressant medications which can weaken the immune functions of patients [5,6]. A

systematic review and meta-analysis study revealed that people with hypertension, diabetes mellitus, cardiovascular and respiratory system diseases were the most affected groups for COVID-19 pandemic [7].

COVID-19 characterized by fast transmission and can occur by close contact with infected individuals [8—11]. This pandemic affects many people throughout the world in the form of death, morbidity and mortality. At the time of writing this article (March 12, 2021) 118,268,575 have been affected by COVID-19 with 2,624,677 recorded deaths globally. Situation in Ethiopia 171,210 confirmed cases with 2483 deaths until the current date mentioned above [12]. COVID-19 pandemic also affects the economy of the world because it hits all the major economic sectors throughout the globe [13].

Even though different trials were conducted to get the treatment for COVID-19, until now confirmed treatment did not get anywhere throughout the world but WHO recommend the prevention and control method strategies through a combination of public health measures [14,15]. Despite of different interventions were performed, the transmission of the virus still a public health agenda in many countries including Ethiopia. Low level of knowledge, attitude problem and poor practice among the populations especially vulnerable group like chronic disease patients may contribute for the spread of the pandemic [16,17]. There are many studies that assessed KAP towards the outbreak on general population and health care workers in different settings [18—26]. But KAP studies on highly vulnerable chronic diseases patients are very limited throughout the world [17].

Therefore assessing chronic disease patients KAP towards COVID-19 pandemic is unquestionable because there is a need to support them and their families. Thus, understanding the KAP of chronic disease patients towards COVID-19 pandemic has supreme importance to address the problem. The findings of this result are noteworthy to design appropriate policies, programs and strategies to address the different problems of chronic disease patients by identifying their gaps with regard to KAP of the outbreaks and associated factors. The finding could also add to the existing base of knowledge of the pandemic on chronic diseases patients KAP. This in turn may help to improve the quality of health care and patients' safety. In general this study will provide valuable information to Dessie town and South Wollo zone health office, health professionals and policy makers to plan their resource and implement accordingly as the pandemic is still a public health agenda in Ethiopia.

2. Methods and materials

2.1. Study design, area and period

Institution based cross-sectional study design was carried out in Dessie town hospitals from July 20 to August 5, 2020. Dessie town is found in South Wollo Zone, Amhara region, Ethiopia. It is situated 401 Km North of Addis Ababa in a mountainous landscape and it is far from Bahirdar 480 km which is the capital city of Amhara regional sate.

2.2. Study subjects

All patients with chronic diseases who attended the outpatient different clinics and inpatient department in Dessie town government and private hospitals were the sources population whereas all patients with chronic diseases who attended selected Dessie town government and private hospitals were the study population. The inclusion criteria for this study were all patients with chronic disease aged 18 years and above who visit both government and

private hospitals in Dessie town during the study period while the exclusion criteria were critical ill and hearing impairment patients.

2.3. Sample size determination

A single population proportion formula was used. The assumptions used to calculate the actual sample size were: 95% level of confidence interval which yields $Z \alpha/2 = 1.96$ on the standard normal distribution curve, 5% margin of error, to get maximum sample size assuming 50% prevalence for knowledge, attitude and practice because as our knowledge there were no published data on chronic diseases patients KAP towards COVID-19 up to the date of data collection in our country. Then by adding 10% non-response rate the final sample size was 422 chronic diseases patients.

2.4. Sampling technique and procedure

In Dessie town there are 2 government hospital (Dessie referral and Borumeda hospitals) and 3 private hospitals (Baty, Ethio and Selam hospitals). From 5 hospitals found in Dessie town, 3(one government and 2 private) hospitals were selected by simple random sampling technique. Hospitals selected randomly were Dessie referral hospital, Ethio general hospital and Selam general hospital. The daily average chronic disease patients attended in selected hospitals at both out-patient clinics and in-patient departments were estimated. Then, based on patients load, sample size was allocated proportionally in three hospitals: DRH = 295, EGH = 67, SGH = 60. Finally, systematic random sampling technique was used to collect data from eligible patients.

2.5. Data collection tools

Pre-tested, structured interviewer administered questionnaires were used for data collection which consists five sections.

1. Socio demographic variables: including age, sex, educational level, occupation, residency, marital status, family size and number of house room.
2. Clinical characteristics: type of chronic diseases, duration of chronic disease, presence additional co-morbidities, presence of respiratory symptoms in the past 2 weeks, travel history to other areas in the last 2 weeks, having social support, member of community based health insurance, use of face mask and hand sanitizer.
3. Knowledge questionnaires: taken from previous studies done in Chinese residents' and Malaysia public [20,26]. It contains 13 items to measure knowledge of chronic diseases patients towards COVID-19 about clinical presentations (items 1—4), rout of transmission (items 5—8) and prevention and control of the outbreak (items 9—13). These items prepared in the form of true/false with an additional "I am not sure" response. A correct response to the question was awarded 1 point, while an incorrect and not sure response was assigned 0 points. A higher score indicating better knowledge about the pandemic. The Cronbach alpha for knowledge (13 items) was 0.655 and considered adequate and reliable. It showed that the items used to measure knowledge on COVID-19 are acceptable [20,27].
4. Attitude questionnaires: Six statements adopted from literature which assessed participants' attitudes toward COVID 19, using a five-point Likert scale, i.e. 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) and 5 (Strongly Agree). Overall score calculated by adding each individual's scores out of 30. Total scores ranged from six to 30, high scores indicating positive attitudes. The Likert scales were assessed for internal reliability

by using Cronbach's a. Cronbach's alpha coefficient was 0.81, indicating internal reliability [18].

5. Practice questionnaires: Eight questions were prepared from previous study with two options namely 'Yes' and 'No' to assess practice towards COVID-19 [19].

2.6. Data collection procedure and quality control

Data quality was insured by translating the questionnaire from English to Amharic by considering the culture and norms of the society and then back to English to check the consistency. The data were collected under regular supervision after giving training for enumerators about procedures, techniques and ways of collecting the data. In addition to ensure the quality of data, the data collection tool was pre tested 10% of the total sample size prior to the actual data collection period in the non-selected hospital (Baty hospital) in order to check for the accuracy of responses, clarity of language and appropriateness of the tools. Data collection process done by wearing face mask and well ventilated room by keeping a minimum distance of 2 m from the patients.

2.7. Operational definition

➢ Good knowledge: Overall knowledge was categorized by using Bloom's cut-off point, as good if the score was from 80% to 100%.

➢ Moderate knowledge: Overall knowledge was categorized by using Bloom's cut-off point, as moderate if the score was from 60% to <80%.

➢ Poor knowledge: Overall knowledge was categorized by using Bloom's cut-off point, as poor if the score was less than 60%.

➢ Good attitude: Overall attitude was categorized by using Bloom's cut-off point, as good if the score was from 80% to 100%.

➢ Moderate attitude: Overall attitude was categorized by using Bloom's cut-off point, as moderate if the score was from 60% to <80%.

➢ Poor attitude: Overall attitude was categorized by using Bloom's cut-off point, as poor if the score was less than 60%.

➢ Good practice: Overall practice was categorized by using Bloom's cut-off point, as good if the score was from 80% to 100%.

➢ Moderate practice: Overall practice was categorized by using Bloom's cut-off point, as moderate if the score was from 60% to <80%.

➢ Poor practice: Overall practice was categorized by using Bloom's cut-off point, as poor if the score was less than 60% [28,29].

2.8. Data processing and analysis

Data was coded and entered in to Epidata 3.1 and then it was exported to SPSS version 23.0 for statistical analysis. Descriptive statistics of continuous variables presented by using mean, and discrete variables presented by using percentage as well as tables and graphs. Ordinal logistic regression was a reasonable approach to use our data given that all the dependent variables are ordered categorically. We found that the proportional odds assumption was violated for all the three dependent variables in preliminary analysis. Therefore, multinomial logistic regression analysis was utilized after checking model fitting criteria and goodness-of-fit. Variables were declared statistically and significantly associated to dependent variables at p-value of <0.05. Moreover, strength of association between factors and the dependent variables were determined using Adjusted Odds Ratio (AOR) with 95% confidence level.

3. Results

3.1. Socio-demographic characteristics of the study participants

The response rate in this study was 413(97.9%). The mean age of participants was 48.2 years (SD ± 15.829 years) and the minimum and maximum ages were 18 and 80 years, respectively. Among the participants 215(52.1%) were females and 268(64.9%) were urban dwellers. Of all participants, 191(46.2%) had no formal education (Table 1).

3.2. Clinical characteristics of study participants

Of all study participants, 94(22.8%), 86(20.8%), 76(18.4%) and 63(15.3%) were hypertensive, diabetes mellitus, chronic heart disease and multiple illness patients, respectively. From all patients, 42(10.2%) have been living with their disease for more than ten years. Regarding risk assessment to the current pandemic, no one had contact history with a known confirmed COVID-19 cases; however, 41(9.9%) clients had reported respiratory symptoms and 16(3.9%) had travel history to other areas in the last two weeks. Furthermore, 81(19.6%) clients have no social support if they were isolated or quarantined due to COVID-19 (Table 2).

3.3. Chronic disease patients' knowledge towards COVID-19 pandemic

Most of the participants (88.9%) reported correctly that people who have contact with someone infected with COVID-19 virus should be immediately isolated in a proper place. Three hundred twenty seven (79.2%) participants responded correctly the main clinical symptoms of COVID-19. Majority of chronic diseases patients (82.3%) said that to prevent the infection from COVID-19, individuals should avoid going to crowded places and avoid taking public transportations (See Table 3 for more details).

Table 1

Socio-demographic characteristics of chronic disease patients in Dessie town government and private hospitals, Northeast Ethiopia, (n = 413).

Variables	Category	Frequency	Percentage
Age in year	18—34	139	33.7
	35—54	128	31.0
	>=55	146	35.3
Sex	Female	215	52.1
	Male	198	47.9
Residence	Urban	268	64.9
	Rural	145	35.1
Marital status	Single	86	20.8
	Married	287	69.5
	Divorced	15	3.6
	Widowed	25	6.1
Occupation	Housewives	159	38.5
	Employed	85	20.6
	Students	61	14.8
	Farmer	60	14.5
	Unemployed	27	5.1
	Merchant	21	6.5
Educational status	No formal education	191	46.2
	Primary school	91	22.0
	Secondary school	87	21.1
	College and above	44	10.7
Household family size	1—3	167	40.4
	>=4	246	59.6
Household room number	1	83	20.1
	2	98	23.7
	>=3	232	56.2

Table 2
Clinical characteristics of chronic disease patients in Dessie town government and private hospitals, Northeast Ethiopia, (n = 413).

Variables	Category	Frequency	Percentage (%)
Type of chronic disease	Hypertension	94	22.8
	Diabetes mellitus	86	20.8
	Heart disease	76	18.4
	Multiple illness[a]	63	15.3
	Kidney disease	35	8.5
	Respiratory disease	30	7.3
	HIV/AIDS	22	5.3
	Others[b]	7	1.7
Duration of chronic disease(in year)	<5	307	74.3
	5–10	64	15.5
	>10	42	10.2
Presence of additional Co-morbidity?	Yes	63	15.3
	No	350	84.7
Presence of respiratory symptoms in the last two weeks?	Yes	41	9.9
	No	372	90.1
Travel history to other areas in the last two weeks?	Yes	16	3.9
	No	397	96.1
Are you member of community based health insurance?	Yes	194	47.0
	No	219	53.0
Do you have social support if you are isolated/quarantined due to COVID-19?	Yes	332	80.4
	No	81	19.6
Have you wear face mask?	Yes	261	63.2
	No	152	36.8
Do you use hand sanitizers?	Yes	110	26.6
	No	303	73.4

[a] Had more than one chronic disease.
[b] Nerve disease, cancer.

Table 3
Chronic disease patients' knowledge towards COVID-19 pandemic in Dessie town government and private hospitals, Northeast Ethiopia.

S.No	Knowledge questions	True N(%)	False N (%)	I am not sure N (%)
1	The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and body aches. (True)	327(79.2)	48(11.6)	38(9.2)
2	Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus. (True)	113(27.4)	234(56.7)	66(16.0)
3	Currently, there is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection. (True)	330(79.9)	8(1.9)	75(18.2)
4	Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly and have chronic illnesses are more likely to be severe cases. (True)	316(76.5)	28(6.8)	69(16.7)
5	Eating or touching wild animals is the primary cause COVID-19 infection. (False)	198(47.9)	83(20.1)	132(32.0)
6	Persons with COVID-19 cannot infect the virus to others if they do not have a fever. (False)	65(15.7)	262(63.4)	86(20.8)
7	The COVID-19 virus spreads via respiratory droplets of infected individuals. (True)	342(82.8)	6(1.5)	65(15.7)
8	The COVID-19 virus is airborne. (False)	181(43.8)	108(26.2)	124(30.0)
9	Ordinary residents can wear face masks to prevent the infection by the COVID-19 virus. (True)	291(70.5)	82(19.9)	40(9.7)
10	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus. (False)	29(7.0)	326(78.9)	58(14.0)
11	To prevent the infection by COVID-19, individuals should avoid going to crowded places and avoid taking public transportations. (True)	340(82.3)	27(6.5)	46(11.1)
12	Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus. (True)	364(88.1)	3(0.7)	46(11.1)
13	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the isolation period is 14 days. (True)	367(88.9)	6(1.5)	40(9.7)

Correct answers indicated in bracket.

3.4. Chronic disease patients' attitude towards COVID-19 pandemic

Of the participants 41.2% and 53.3% of them agree and strongly agree by saying it is important to keep my distance from others, to avoid spreading of SARS-CoV-2, respectively. Washing hands is essential to protect myself from COVID-19 by 40.4% agree and 54.0% strongly agree response (See Table 4 for more details).

3.5. Chronic disease patients' practice towards COVID-19 pandemic

From study participants 86.9%, 85.2%, 83.8% and 81.6% of chronic diseases patients, COVID-19 made them to increase the frequency of washing hands, avoid unnecessary travel, cover cough and sneeze with a tissue, handkerchief and maintain social distance during the outbreak, respectively (Table 5).

3.6. Chronic disease patients' overall knowledge, attitude and practice towards COVID-19 pandemic

In overall, 143(34.6%) (95% CI: 30.3–39.7) and 145(35.1%) (95% CI: 30.8–39.7) of participants had good and moderate knowledge about COVID-19, respectively. However, 125(30.3%) (95% CI: 25.7–34.9) of participants had poor knowledge. Regarding their attitude, majority of participants 336(81.4%) (95% CI: 77.7–85.5) had good attitude towards COVID-19, 50(12.1%) (95% CI: 9.2–15.3) had moderate attitude and 27(6.5%) of patients had poor attitude

Table 4
Chronic disease patients' attitude towards COVID-19 pandemic in Dessie town government and private hospitals, Northeast Ethiopia.

S.No	Attitude questions	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		N (%)	N (%)	N (%)	N (%)	N (%)
1	It is important to keep my distance from others, to avoid spreading SARS-CoV-2.	3(0.7)	3(0.7)	17(4.1)	170(41.2)	220(53.3)
2	Washing hands is essential to protect myself from COVID-19.	3(0.7)	4(1.0)	16(3.9)	167(40.4)	223(54.0)
3	To protect myself from COVID-19 exposure, I should stay home if I am sick, unless I am receiving medical care.	3(0.7)	21(5.1)	17(4.1)	164(39.7)	208(50.4)
4	COVID-19 will eventually be successfully controlled.	6(1.5)	3(0.7)	63(15.3)	158(38.3)	183(44.3)
5	Ethiopia's measures can help win the battle against COVID-19.	14(3.4)	3(0.7)	68(16.5)	150(36.3)	178(43.1)
6	Compliance with the Ministry of Health precautions will prevent the spread of COVID-19.	3(0.7)	6(1.5)	29(7.0)	169(40.9)	206(49.9)

Table 5
Chronic disease patients' practice towards COVID-19 pandemic in Dessie town government and private hospitals, Northeast Ethiopia.

S.No	Practice questions	Yes	No
		N (%)	N (%)
1	Did the outbreak of the COVID-19 virus make you increase the frequency of washing hands?	359(86.9)	54(13.1)
2	Did the outbreak of the COVID-19 virus make you use hand sanitizer more frequently?	142(34.4)	271(65.6)
3	Did the outbreak of the COVID-19 virus make you use personal protective equipment (e.g. mask) more frequently?	319(77.2)	94(22.8)
4	Did you carry hand sanitizer with you during the outbreak in Ethiopia?	252(61.0)	161(39.0)
5	Did you write down or store in your phone any helpline number to contact in case you suspected that you or someone you know had the COVID-19 virus?	170(41.2)	243(58.8)
6	Did you maintain social distance during the outbreak?	337(81.6)	76(18.4)
7	Did you cover cough and sneeze with a tissue, handkerchief, etc. during the outbreak?	346(83.8)	67(16.2)
8	Did you avoid unnecessary travel or outing during the outbreak?	352(85.2)	61(14.8)

towards the current pandemic disease. Furthermore, 168(40.7%) (95% CI: 36.1–45.3) participants had good practice and 143(34.6%) had poor practice towards COVID-19 prevention and controlling methods. However, 102(24.7%) (95% CI: 20.6–28.8) of respondents' practice to prevent COVID-19 was found to be moderate (Fig. 1).

3.7. Factors associated with knowledge of chronic disease patients' towards COVID-19 pandemic

The multinomial logistic regression analysis revealed that young age (AOR: 2.640; 95% CI: 1.393–5.001, p = 0.003), urban residency (AOR: 1.922; 95% CI: 1.138–3.247, p = 0.015), attainment of secondary education (AOR: 3.473; 95% CI: 1.087–11.09, p = 0.036) and presence of additional co-morbidity (AOR: 0.404; 95% CI: 0.197–0.827, p = 0.013) were predictors of moderate knowledge. Whereas, urban residency (AOR: 2.934; 95% CI: 1.678–5.129, p < 0.001), not attended formal education (AOR: 0.405; 95% CI: 0.169–0.969, p = 0.042) and presence of additional co-morbidity (AOR: 0.290; 95% CI: 0.127–0.664, p = 0.003) were predictors of good knowledge about COVID-19 (Table 6).

Those who were found in the age group of 18–34 years were more likely to had moderate knowledge about COVID-19 than poor knowledge as compared to those who were>=55 years. Urban residents were more likely to had moderate and good knowledge about COVID-19 than poor knowledge as compared to rural residents. Participants who had completed secondary education were more likely to had moderate knowledge about COVID-19 than poor knowledge as compared to those who attended college and above.
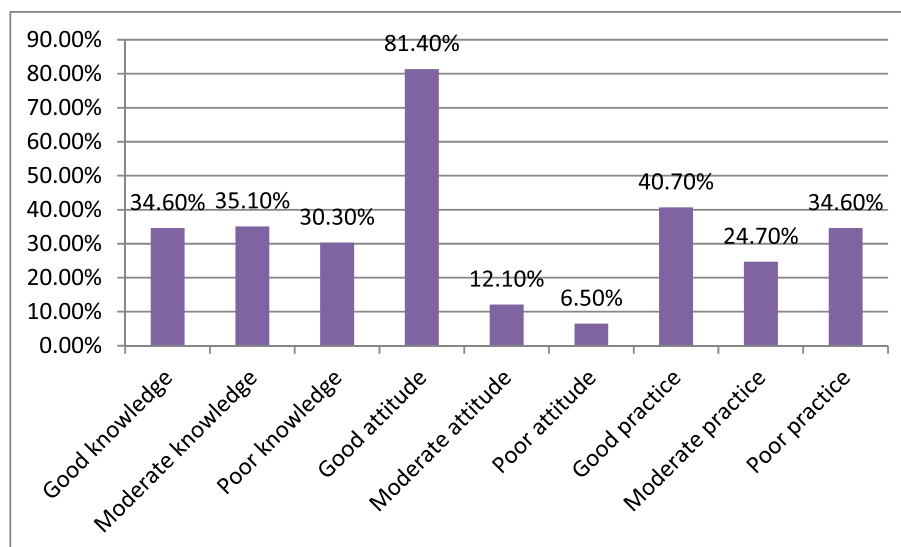

Fig. 1. Chronic disease patients' overall Knowledge, Attitude and Practice towards COVID-19 pandemic in Dessie town government and private hospitals, Northeast Ethiopia.

Table 6
Factors associated with knowledge of chronic disease patients' towards COVID-19 pandemic in Dessie town government and private hospitals, Northeast Ethiopia.

Knowledge[a]	Variables	Category	AOR(95% CI)	P-value
Moderate	Age	18–34	2.640(1.393–5.001)	0.003
		35–54	1.305(0.695–2.450)	0.408
		>=55	1	
	Sex	Male	0.916(0.543–1.544)	0.742
		Female	1	
	Residence	Urban	1.922(1.138–3.247)	0.015
		Rural	1	
	Educational status	No formal education	2.821(0.941–8.458	0.064
		Primary school	3.064(0.966–9.716)	0.057
		Secondary school	3.473(1.087–11.09)	0.036
		College and above	1	
	Duration of chronic disease(in year)	<5	0.682(0.291–1.596)	0.377
		5–10	1.507(0.524–4.334)	0.447
		>10	1	
	Presence of additional Co-morbidity	Yes	0.404(0.197–0.827)	0.013
		No	1	
	Presence of respiratory symptoms in the last two weeks?	Yes	1.960(0.846–4.543)	0.116
		No	1	
	Used face mask	Yes	0.949(0.551–1.636)	0.851
		No	1	
	Used hand sanitizers	Yes	1.237(0.683–2.243)	0.483
		No	1	
Good	Age	18–34	1.503(0.780–2.897)	0.224
		35–54	0.852(0.452–1.604)	0.619
		>=55	1	
	Sex	Male	0.664(0.387–1.137)	0.135
		Female	1	
	Residence	Urban	2.934(1.678–5.129)	<0.001
		Rural	1	
	Educational status	No formal education	0.405(0.169–0.969)	0.042
		Primary school	0.579(0.225–1.488)	0.257
		Secondary school	0.578(0.223–1.497)	0.259
		College and above	1	
	Duration of chronic disease(in year)	<5	0.857(0.345–2.128)	0.740
		5–10	1.793(0.584–5.499)	0.307
		>10	1	
	Presence of additional co-morbidity	Yes	0.290(0.127–0.664)	0.003
		No	1	
	Presence of respiratory symptoms in the last two weeks?	Yes	0.455(0.143–1.451)	0.183
		No	1	
	Used face mask	Yes	0.833(0.478–1.453)	0.520
		No	1	
	Used hand sanitizers	Yes	1.222(0.664–2.249)	0.520
		No	1	

[a] The reference category is poor.

Similarly, those who had not taken formal education were less likely to had good knowledge about COVID-19 than poor knowledge as compared to those who attended college and above. Patients who had additional co-morbidities were less likely to had moderate and good knowledge about COVID-19 than poor knowledge as compared to those who had no co-morbidity.

3.8. Factors associated with attitude of chronic disease patients' towards COVID-19 pandemic

In multinomial logistic regression, young age (AOR: 0.237; 95% CI: 0.062–0.911, p = 0.036) was found to be the only predictor of moderate attitude towards COVID-19. However, sex (AOR: 0.253; 95% CI: 0.099–0.647, p = 0.004) and facemask users (AOR: 3.293; 95% CI: 1.397–7.762, p = 0.006) were predictors of good attitude of participants towards COVID-19 pandemic (Table 7).

Those who were found in the age group of 18–34 years were less likely to had moderate attitude towards COVID-19 than poor attitude as compared to those who were>=55 years). Males were less likely to had good attitude towards COVID-19 than poor attitude as compared to females. Those participants who had used facemask were more likely to had good attitude towards COVID-19 than poor attitude as compared to non-facemask users.

3.9. Factors associated with practice of chronic disease patients' towards COVID-19 pandemic

Household family size (AOR: 1.906; 95% CI: 1.069–3.398, p = 0.029) and presence of additional co-morbidity (AOR: 2.262; 95% CI: 1.045–4.895, p = 0.038) were factors significantly associated with moderate practice of COVID-19 prevention methods. Furthermore, male sex (AOR: 2.262; 95% CI: 1.045–4.895, p = 0.038), household family size (AOR: 1.892; 95% CI: 1.107–3.234, p = 0.020), COVID-19 knowledge (AOR: 0.209; 95% CI: 0.103–0.427, p < 0.001) and attitude towards COVID-19 (AOR: 0.138; 95% CI: 0.034–0.562, p = 0.006) were factors significantly associated with good practice of COVID-19 prevention methods(Table 8).

Those who had household family size of 1–3 were more likely to have moderate and good practice towards COVID-19 prevention methods than poor practice as compared to those who had family size of 4 and above. Patients who had additional co-morbidities were more likely to have moderate practice towards COVID-19 prevention methods than poor practice as compared to those who had no co-morbidity. Males were less likely to have good

Table 7
Factors associated with Attitude of chronic disease patients' towards COVID-19 pandemic in Dessie town government and private hospitals, Northeast Ethiopia.

Attitude[a]	Variables	Category	AOR(95% CI)	P-value
Moderate	Age	18–34	0.237(0.062–0.911)	0.036
		35–54	0.335(0.096–1.166)	0.086
		>=55	1	
	Sex	Male	0.617(0.208–1.831)	0.384
		Female	1	
	Residence	Urban	0.707(0.250–1.999)	0.513
		Rural	1	
	Educational status	No formal education	1.204(0.246–5.901)	0.819
		Primary school	0.536(0.079–3.654)	0.524
		Secondary school	0.743(0.104–5.337)	0.768
		College and above	1	
	Duration of chronic disease(in year)	<5	1.222(0.263–5.682)	0.798
		5–10	0.550(0.070–4.308)	0.569
		>10	1	
	Presence of additional Co-morbidity	Yes	1.760(0.489–6.341)	0.387
		No	1	
	Presence of respiratory symptoms in the last two weeks?	Yes	0.216(0.039–1.185)	0.078
		No	1	
	Used face mask	Yes	2.214(0.798–6.144)	0.127
		No	1	
Good	Age	18–34	0.821(0.273–2.473)	0.726
		35–54	0.635(0.213–1.893)	0.415
		>=55	1	
	Sex	Male	0.253(0.099–0.647)	0.004
		Female	1	
	Residence	Urban	1.236(0.514–2.973)	0.636
		Rural	1	
	Educational status	No formal education	1.048(0.284–3.869)	0.944
		Primary school	2.145(0.511–8.998)	0.297
		Secondary school	2.527(0.557–11.47)	0.230
		College and above	1	
	Duration of chronic disease(in year)	<5	1.040(0.279–3.883)	0.953
		5–10	1.343(0.277–6.522)	0.714
		>10	1	
	Presence of additional Co-morbidity	Yes	0.441(0.144–1.355)	0.152
		No	1	
	Presence of respiratory symptoms in the last two weeks?	Yes	0.481(0.142–1.627)	0.239
		No	1	
	Used face mask	Yes	3.293(1.397–7.762)	0.006
		No	1	

[a] The reference category is poor.

practice towards COVID-19 prevention methods than poor practice as compared to females. Participants who had poor knowledge about COVID-19 were less likely to have good practice towards COVID-19 prevention methods than poor practice as compared to those who had good knowledge. Similarly, those who had poor and moderate attitude towards COVID-19 were less likely to have good practice towards COVID-19 prevention methods than poor practice as compared to those who had good attitude.

4. Discussion

The spread of the COVID-19 pandemic is a major public health agenda throughout the world. To minimize the spread of the disease prevention of its transmission is the best solution. Effective control of COVID-19 is achieved through increasing the populations' knowledge, attitude and practice towards COVID-19 especially for those high risk groups of chronic diseases patients. Therefore, the current study investigated the chronic disease patients' knowledge, attitude and practice towards COVID-19. The findings of this study could help to inform policy makers, health professionals, researchers, non-governmental organizations and medias of the country to put their contribution on COVID-19 pandemic for those vulnerable groups who are in need.

In this study, 30.3% (95% CI: 25.7–34.9) of chronic diseases patients had poor knowledge towards COVID-19 pandemic. This study

supported by a study done in Addis Zemen hospital (33.9%) [17]. This finding was higher than studies done in Jimma University medical center visitors (17.0%), China (10%) and Iran [24,26,30]. The possible reason for this difference might be due to the presence of variation in the socioeconomic status of the study participants and difference in the time of data collection period across various studies. In addition majority of Ethiopian people had no access to internet and electricity so that our population had limited access to COVID-19 pandemic related information that is shown to have a positive effect for improving of knowledge towards this disease [31,32]. Majority (88.9%) of the study participants reported correctly that people who have contact with someone infected with COVID-19 virus should be immediately isolated in a proper place. This finding similar with study conducted in Jimma University medical center visitors (87.4%) [24]. But it is higher than study done in Addis Zemen hospital (60.6%) and lower than study carried out in Malaysia population (99.1%) [17,20]. This discrepancy might be due to a difference in study population, socioeconomic and educational status in various study settings.

Majority of chronic disease patients (81.4%) (95% CI: 77.7–85.5) in this study had good attitude towards COVID-19 preventive measures. Even if, this attitude seems high still it needs intervention to reach near to hundred percent. It is important to keep distance from others, to avoid spreading SARS-CoV-2 by 41.2% agrees and 53.3% strongly agree response of chronic disease patients. This

Table 8
Factors associated with Practice of chronic disease patients towards COVID-19 pandemic in Dessie town government and private hospitals, Northeast Ethiopia.

Practice[a]	Variables	Category	AOR(95% CI)	P-value
Moderate	Age	18–34	0.665(0.334–1.324)	0.245
		35–54	0.815(0.430–1.545)	0.531
		>=55	1	
	Sex	Male	0.645(0.367–1.132)	0.127
		Female	1	
	Residence	Urban	1.242(0.676–2.282)	0.484
		Rural	1	
	Family size	1–3	1.906(1.069–3.398)	0.029
		>=4	1	
	Educational status	No formal education	1.589(0.647–3.902)	0.313
		Primary school	0.505(0.172–1.480)	0.213
		Secondary school	0.464(0.160–1.344)	0.157
		College and above	1	
	Duration of chronic disease(in year)	<5	0.852(0.330–2.200)	0.740
		5–10	0.969(0.311–3.027)	0.957
		>10	1	
	Presence of additional Co-morbidity	Yes	2.262(1.045–4.895)	0.038
		No	1	
	Presence of respiratory symptoms in the last two weeks?	Yes	0.878(0.321–2.399)	0.800
		No	1	
	Knowledge	Poor	1.089(0.535–2.214)	0.814
		Moderate	1.261(0.606–2.622)	0.535
		Good	1	
	Attitude	Poor	0.562(0.206–1.536)	0.261
		Moderate	1.304(0.619–2.750)	0.485
		Good	1	
Good	Age	18–34	1.673(0.905–3.095)	0.101
		35–54	1.133(0.598–2.146)	0.701
		>=55	1	
	Sex	Male	0.353(0.209–0.596)	<0.001
		Female	1	
	Residence	Urban	0.717(0.406–1.265)	0.250
		Rural	1	
	Family size	1–3	1.892(1.107–3.234)	0.020
		>=4	1	
	Educational status	No formal education	1.683(0.658–4.303)	0.277
		Primary school	2.624(0.993–6.931)	0.052
		Secondary school	1.696(0.642–4.481)	0.287
		College and above	1	
	Duration of chronic disease(in year)	<5	0.742(0.311–1.767)	0.500
		5–10	0.671(0.240–1.875)	0.447
		>10	1	
	Presence of additional Co-morbidity	Yes	1.381(0.639–2.983)	0.441
		No	1	
	Presence of respiratory symptoms in the last two weeks?	Yes	1.728(0.671–4.450)	0.257
		No	1	
	Knowledge	Poor	0.209(0.103–0.427)	<0.001
		Moderate	0.950(0.520–1.735)	0.867
		Good	1	
	Attitude	Poor	0.138(0.034–0.562)	0.006
		Moderate	0.354(0.127–0.988)	0.047
		Good	1	

[a] The reference category is poor.

result showed discrepancy with study done among the public in the Kingdom of Saudi Arabia, where 18.18% and 78.6% agree and strongly agree response, respectively [18].

With regard to COVID-19 preventive practice, (34.6%) (95% CI: 30.0–39.2) had poor practice towards COVID-19 prevention and controlling methods. This result lower than study conducted in Addis Zemen hospital (47.3%) [17]. The reason for this discrepancy might be due to our study participants live in urban when we compare that of Addis Zemen. As people living in urban they may get more information about COVID-19 preventive methods and they might practice accordingly. While majority of the participants increased frequency of practicing most of the preventive and control measures, great gaps were observed in hand sanitizer use (34.4%) and to store any helpline phone number to contact in case there is suspected case of COVID-19 virus (41.2%). This result lower than study carried out in India, where 92.7% used hand sanitizer

and 60.7% stored phone number in case there is suspected person with COVID-19 for the purpose of contacting [19]. The possible reason for this disparity might be a presence of difference in study participants, media exposure, phase of the pandemic in the study area, and worry related to the outbreak of study participants which lead to the variation in recommended practice to prevent COVID-19 outbreak.

Urban residents were more likely to had moderate and good knowledge about COVID-19 than poor knowledge as compared to rural residents. This study supported by a study done in Addis Zemen hospital in which Rural residents were more likely to had poor knowledge than urban residents [17]. This might be due to lack of access to information in rural areas, where internet and electricity access limitation present that restricts them to update their knowledge about COVID-19 pandemic. Participants who had not taken formal education were less likely to had good knowledge

about COVID-19 as compared to those who attended education at college and above level. The possible justification might be illiterate people have reduced ability to understand health information and health promotion activities to prevent COVID-19 so that they would have less knowledge [33,34]. Patients having additional co-morbidity were less likely to had moderate and good knowledge than poor knowledge about COVID-19 as compared to those who had no other co-morbidity. This might be due to comorbid patients had over burden by their diseases which may decrease their attention towards COVID-19 related information.

Males were less likely to had good attitude and practice towards COVID-19 preventive and control measures as compared to females. The possible reason might be females by nature give more attention for sensitive issues including COVID-19 than their counterpart male participants. Facemask user participants were more likely to had good attitude towards COVID-19 when we compare with non-facemask users. This implies that persons having favorable attitude about COVID-19 use preventive measures of the pandemic.

Household family size of 1–3 were more likely to have moderate and good practice towards COVID-19 prevention and control methods as compared to those who had family size of 4 and above. The possible justification for this may be low family size is important to minimize the pandemic by using hand sanitizer and personal protective equipment economically and to maintain social distance in their house. Furthermore, participants who had poor knowledge and attitude about COVID-19 were less likely to have good practice towards COVID-19 prevention and control measures as compared to those who had good knowledge and attitude. This finding consistent with study conducted in Addis Zemen hospital and China, where participants having poor knowledge were more likely to have poor practice [17,26]. The possible reason might be due to knowledge is the main factor for good practice toward COVID-19 mitigation measures and these activities are performed after having an awareness of knowledge activities. This suggesting that health education programs aimed at improving COVID-19 knowledge are helpful to maintain safe practices [26].

5. Conclusion

Substantial number of patients with chronic disease had poor knowledge and practice towards COVID-19 pandemic. Our findings also identify factors affecting knowledge, attitude and practice of chronic diseases patients towards COVID-19. Therefore government, non-government organizations, health professionals, different Medias, researchers and health institution administrations should do to improve the gaps of chronic diseases patients. Health education programs aimed at mobilizing and improving COVID-19 pandemic knowledge and preventive practice are needed for those chronic disease patients. Leaflets should be prepared and given to patients on chronic follow up clinics and inpatient departments with detailed information about COVID-19 and its preventive measures. Our finding also provides a baseline for evaluating prevention, control and treatment efforts throughout the remaining of the COVID-19 pandemic, which is still ongoing in Ethiopia.

5.1. Limitations of the study

One of the principal limitations is that due to the cross-sectional nature of the research, it is difficult to draw conclusions regarding its long-term effect. The findings in this study were based on quantitative method only that lacked triangulation with other methods like focus group discussion and in-depth interview. Another limitation is that respondents might give socially acceptable answers for attitude and practice questionnaire.

Abbreviations

AOR	Adjusted odds ratio
ARDS	Acute respiratory distress syndrome
CI	confidence interval
COR	Crude odds ratio
COVID-19	Corona virus disease 2019
DIC	Disseminated intravascular coagulation
DRH	Dessie referral hospital
EGH	Ethio general hospital
KAP	Knowledge, attitude and practice
SARS-CoV-2	Severe acute respiratory syndrome coronavirus-2
SD	Standard deviation
SGH	Selam general hospital
SPSS	Statistical program for social sciences
WHO	World health organization

Data sharing statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethical issue

Ethical clearance was obtained from Wollo University College of medicine and health science research ethical review committee. The ethical clearance letter reference number is WU/324/T-01/2020. Data was collected after informed written consent was obtained from each participant.

Authors' contributions

SGA: initiated the idea, develop the proposal, data entry, statistical analysis, interpretation of the data and writing the manuscript draft. ADN: edit the proposal, data entry, statistical analysis, training of data collectors. DGM: data entry, statistical analysis and recruitment of data collectors. All authors read and approved the final manuscript.

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