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ORIGINAL RESEARCH

Perception Towards COVID-19 Related Symptoms and Traditional Medicine Used for Their Management Among Patients and Their Attendants in Ethiopian Comprehensive Specialized Hospitals: A Cross-Sectional Study

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Background: Since the beginning of the pandemic, scientists and researchers are highly engaged in the discovery and production of vaccines and specific treatments for COVID-19. In China, the National Health Commission has declared the use of herbal medicine combined with Western medicine as a treatment for COVID-19 and has issued many guidelines on herbal medicine-related therapies. Ethiopians have a variety of medicinal herbs to treat various viral diseases. Hence, this study aimed to assess the perception of the respondent towards COVID-19 related symptoms and traditional medicine practice for their management.

Methods: A hospital-based cross-sectional study was done among 423 patients and patient attendants at the University of Gondar Comprehensive Specialized Hospital from August 6 to 27, 2021. Data were collected using a structured questionnaire, and the data were entered into Epi Info 7 and then analyzed with SPSS 20. The association between the independent and dependent variables was explained using chi-square test.

Results: A total of 423 respondents participated in the study; 414 (97.9%) participants heard about COVID-19 and responded correctly to the chief clinical symptoms. Fever is the most perceived symptom, reported by 378 (91.3) respondents, and the least reported symptom was loss of taste and smell by 30 (7.2%) respondents. This study showed that home remedies were practiced by 323 of the total respondents, and herbal medicines were the second most and practiced by 316 respondents. Monthly income and perceived knowledge about chief symptoms were statistically significantly associated ($p < 0.05$) with the use of complementary and alternative medicine for the management of COVID-19 related symptoms.

Conclusion: This study found that most of the respondents have knowledge about the signs and symptoms of COVID-19 and the traditional medicine is being practiced by most of the study participants as a management for COVID-19 and related symptoms.

Keywords: COVID-19, complementary and alternative medicine, Ethiopia

Introduction

In December 2019, a pneumonia associated with the COVID-19 emerged in Wuhan, Hubei Province, China.[1] It is an infectious disease caused by SARS-CoV-2 virus, which is a serious infection of the respiratory tract which affects both the upper respiratory tract including throat, nose and sinuses, lower respiratory tract and lungs of an infected person.[2] Among the infected patients, COVID-19 shows various unspecific symptoms, ranging from mild to severe. Fever (98%) is the most frequent symptom which is followed by cough (76%), myalgia or fatigue (44%), sputum production (28%), and headache (8%).[3] Since the beginning of the pandemic, scientists and researchers are highly engaged in the discovery and production of vaccines and specific treatments for the COVID-19 disease.[4] Due to the nature of the pandemic,

different countries and regulatory organizations realized that they need to remove stringent patent rules on vaccines and medications for the treatment of this virus.[5]

Despite the fact that there are vaccines available for COVID-19 by different manufacturing industries, people in the community and researchers are making an ongoing trial to find the best way to cure the disease, including natural herbal remedies.[6] In China, the National Health Commission has approved the use of herbal medicine combined with modern medicine as a treatment for COVID-19, and has developed many guidelines on herbal medicine-related therapy.[7] In African countries such as Mali, Ghana, Zambia, and Nigeria, the first line of treatment for 60% of children with high fever resulting from malaria is the use of herbal medicines at home.[8] Ethiopia has a long history of traditional medicine practice with about 80% of the population depending on traditional medicinal practices to safeguard their lives from various diseases.[9] From the medicinal herbs available in Ethiopia;[10,11] *Allium cepa, Allium sativum, Nigella sativum, Brassica juncea, Zingiber officinale, Curcuma longa* and *Capsicum annum* are mentioned in different literature for their antiviral activities (Table 1). Inspired by previous experiences, herbal remedies are being considered as one of the alternative approaches in the treatment of COVID-19.[12] This study aimed to assess the perception of respondents towards Covid-19 related symptoms and traditional medicines used for their management of its symptoms by patients/attendants during the pandemic period.

Methods and Materials
Study Area and Periods
The study was conducted at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia. It is located in Central Gondar Zone, Amhara regional state of Ethiopia, and is 748 km far northwest of Addis Ababa, the capital of Ethiopia, and about 180 km from Bahir Dar city, the capital of Amhara regional state. The University of Gondar Comprehensive Specialized Hospital (UOGCSH) is a teaching hospital which serves more than five million people. It gives referral and specialized diagnostic and treatment services for clients. The UOGCSH was given quarantine of the suspected cases, treatment, and follow-up of COVID-19 patients by providing more than 320 beds.[13] The study was conducted from August 6 to 27, 2021.

Study Design and Population
A hospital-based cross-sectional study design was conducted. All patients who visited the UOGCSH were the source population, whereas among the visitors, those who attended the UOGCSH during our study period were the study population. The visitors were selected from the emergency, inpatient, and outpatient wards.

Table 1 List of Medicinal Plants Which Have Previous Antiviral Activities, 2021

Scientific Name	Local Name	Previous Antiviral Activity	Ref No
Eucalyptus globulus labill.	Nech bahirzaf	Common cold	[37]
Nigella sativa	Tikur azmud	Common cold	
Zingiber officinale roscoe.	Zinjibile	Influenza	
Ruta chalepensis L.	Tena adam	Influenza	
Lepidium sativum	Fetto	Cough	[38]
Allium sativum	Nechshinkurt	Influenza virus	
Citrus aurantifolia	Lomi	Common cold	
Moringa oleifera	Moringa	Common cold	[39]
Zehneria scabra	Haregresa	Rabies	
Ocimum lamiifolium hochst	Damakese	Common cold	
Echinops kebericho	Kebericho	Cough	[38]
Otostegia integrifolia	Tinjut	Common cold	

Inclusion and Exclusion Criteria

All Adults (>18 years old) who attended the UOGCSH during the study period were included in the study, while visitors who were severely ill, psychiatric participants, and health professionals were excluded from the study.

Sample Size Determination and Sampling Procedure

The sample size was determined using the single population proportion formula by taking the following assumptions.

Confidence level (Cl), 95% Proportion = 50%, Margin of error 5%

Using the following single proportion formula:

$$n = \frac{(Z_{\alpha/2})^2 \times P(1-P)}{w^2}$$

n=initial sample size, Z = 1.96, the corresponding Z-score for the 95% CI, P = Proportion = 50%, W = Margin of error = 5% = 0.05

$$n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} = 384$$

The sample size became 384, and after considering a 10% nonresponse rate, the adequate sample final sample size was 423. A nonprobability consecutive sampling method was employed to interview the study participants.

Study Variable

Traditional medicine utilization was a dependent variable, whereas socio-demographic related variables including sex, age, educational level, average monthly income, and visitor's perceived knowledge about chief clinical symptoms were the independent variables.

Data Collection Procedure and Data Quality Assurance

Data were collected using a structured and pretested questionnaire. The questionnaire was pretested on 21 (5%) nonparticipant respondents, having similar characteristics to the study subjects, to identify the potential problems of the questionnaire, unanticipated interpretations, and cultural objections to any of the questions. Considering those respondents who cannot write and read, the questionnaire was read out to them by data collectors. The questionnaire incorporates socio-demographic characteristics, knowledge about COVID-19 symptoms, symptoms experienced by the respondents, and the type of traditional medicine used. The data were collected by four graduating class pharmacy students. The questionnaire was prepared in English and translated into Amharic and then back to English to maintain consistency.

Statistical Analysis

Completeness and consistency of the data was checked on a spot and daily basis by the supervisors and data collectors. The data were entered, cleaned, and coded using Epi info software version 7.2.4 and exported to Statistical Packages for Social Sciences (SPSS) version 20.0 Software for analysis. Descriptive statistics was used to summarize the frequency of study participant background characteristics. The association between the independent and dependent variables was explained using chi-square test. P-values were used to measure how likely is the association between variables and a variable with a p-value ≤0.05 with 95% confidence interval was considered significantly associated with the study outcome variable.

Ethical Consideration

The Helsinki Declaration's ethical guidelines were followed throughout the study's conduct. Ethical clearance was obtained from the Ethical Committee of School of Pharmacy, College of Medicine and Health Sciences, University of Gondar (No. SOP/272/2021). Before the data collection, the purpose of the study was explained, and written informed consent was obtained from the study participants. Individuals who were volunteers to participate in the

study were also told as they have the right to withdraw from the study at any stage of the interview. The confidentiality of the study participants was ensured by avoiding possible identifiers. Furthermore, appropriate infection prevention practices and principles related to COVID-19 were considered during the data collection period. Data collectors provided health education for the respondents after the interview had been completed based on the gaps identified as appropriate.

Results

Socio-Demographic Characteristics

A total of 423 patients and attendants agreed to participate in the interview with a response rate of 100%. From the total respondents, around half (52%) were females, and more than half (61%) were in the age group between 18 and 34 years. Around three-fourths, 316 (74.7%) of the respondents were Orthodox Christian religion followers (Table 2).

Table 2 Socio-Demographic Characteristics of Respondents, UOGCSH, Northwest Ethiopia, 2021 (N = 423)

Variable		Frequency (%)
Gender	Female	220 (52)
	Male	203 (48)
Age	18–34	258 (61)
	35–49	112 (26.5)
	50–65	50 (11.8)
	Above 65	3 (0.7)
Religion	Orthodox	316 (74.7)
	Muslim	47 (11.1)
	Protestant	60 (14.2)
Educational status	Basic education	15 (3.5)
	College diploma	85 (20.1)
	First degree and above	166 (39.2)
	Primary school	25 (5.9)
	Secondary school	81 (19.1)
	Illiterate	44 (10.4)
	Religious education	7 (1.7)
Monthly income	1651–3200	69 (16.3)
	3201–5250	54 (12.8)
	5251–7800	38 (9)
	7801–10,900	36 (8.5)
	10,901 and above	17 (4)
	No salary	43 (10.2)
	Unknown income	166 (39.2)

COVID-19 Related Perceptions of the Study Participants

In our study, 414 (97.9%) participants responded that they heard about the signs and symptoms of COVID-19. Fever is the most perceived symptom and reported by 378 (91.3) respondents, and the least reported was loss of taste and smell by 30 (7.2%) respondents. Television was reported by 300 (72.5%) participants as a source of information. From 423 participants, 147 (35.5%) were experienced chief complaints of the virus. Among all participants, 90 (21.3%) were tested for COVID-19 and 81 (90%) of them were found to be positive (Table 3).

Traditional Medicine Practice for the Treatment of COVID-19 Related Symptoms

In the current study, almost all (99%) of the study participants were involved in practicing traditional medicine for the management of COVID-19 and related symptoms (Figure 1). Home remedies were the most reported types of traditional medicine practice by 323 of the total respondents, and herbal medicines were the second most practiced by 316 respondents (Figure 2).

Mostly used herbal products by participants for the management of COVID-19 related symptoms were Eucalyptus, Damakese, Ginger, Rue, Fetto, Zingibil, Garlic, Lemon tea, and Moringa tea and fumigation of their home and environment with different herbs like Kebericho, Tinjut, Temenay (Table 4).

Association of Independent Variables with Complementary and Alternative Medicine Practice for the Prevention and Treatment of COVID-19 Symptoms

As (Table 5) shows, the statistical association between the independent variables and the practice of traditional medicine for the treatment of COVID-19 related symptoms was done using chi-square test analysis. In this analysis, monthly

Table 3 COVID-19-Related Perceptions Among Respondents About the Management of Signs and Symptoms of COVID-19, Northwest Ethiopia, 2021 (n = 423)

Variables	Categories	Frequency (%)
Do you know the symptoms of COVID-19?	Yes	414 (97.9)
	No	9 (2.1)
If yes, what symptoms of COVID-19 do you know (n = 414)	Cough	371 (89.6)
	Shortness of breath	218 (52.7)
	Fever	378 (91.3)
	Sore throat	79 (19.1)
	Muscle ache	78 (18.8)
	Headache	133 (32.1)
	Loss of smell or test	30 (7.2)
	Nausea and vomiting	52 (12.6)
What is your usual source of information about COVID-19? (n = 414)	Radio	120 (29)
	Television	300 (72.5)
	Social media	171 (41.3)
	People (from relatives)	19 (4.5)
Have you ever experienced symptoms of COVID-19	Yes	147 (35.5)
	No	267 (64.5)

(Continued)

Table 3 (Continued).

Variables	Categories	Frequency (%)
If yes, what symptoms of COVID-19 did you experienced? (n = 147)	Nausea and vomiting	15 (10.2)
	Sore-throat	104 (70.7)
	Facial pains and blocked sinus	33 (22.4)
	Loss of smell and test	52 (35.4)
	Headache	111 (75.5)
	Shortness of breath	36 (24.3)
	Cough	98 (66.7)
	Fever	77 (52.4)
	Fatigue	70 (47.6)
	Chest pain	21 (14.3)
	Diarrhea	12 (2.8)
Have you ever tested for COVID-19	Yes	90 (21.3)
	No	333 (78.7)
If yes, what was the result (n = 90)	Positive	81 (90)
	Negative	9 (10)

income and perceived knowledge about chief symptoms were statistically significantly associated with the use of complementary and alternative medicine for the management of COVID-19 related symptoms.

Discussion

In the current study, we assessed the practice of traditional medicine for the treatment COVID-19 related symptoms and independent factors associated with the practice at UOGCSH, Northwest Ethiopia. Natural products have always been intriguing to scientists for drug research to develop novel candidates.[14]

Figure 1 Traditional medicine practice by visitors of UOGCSH, Northwest Ethiopia, 2021 (n = 423).

Types of Traditional medicine used by the study participants
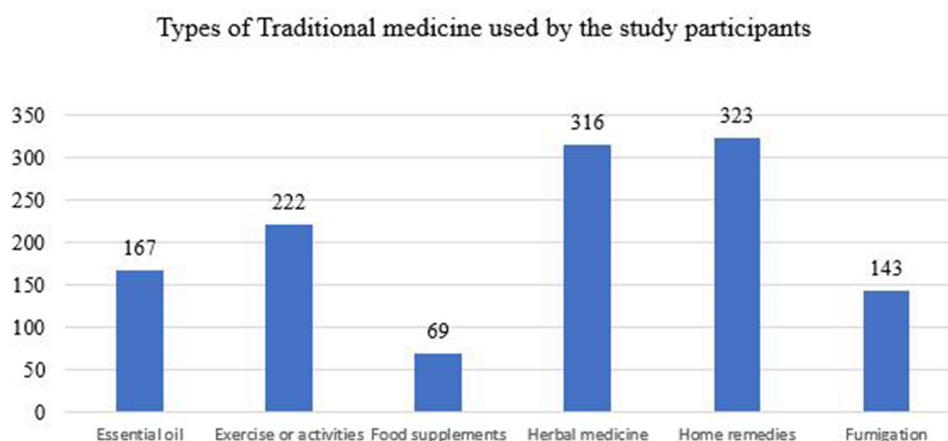

Figure 2 Types of traditional medicine used for the prevention and treatment of COVID-19 symptoms among visitors of UOGCSH, Northwest Ethiopia, 2021 (n = 423).

Medicinal plants are considered very useful by traditional healers in many societies for the management of several diseases and ailments.[15] In this study, 414 (97.9%) of the respondents heard about the main clinical symptoms experienced by a person who had COVID-19. This finding was higher than the studies done in Ethiopia[16,17] and Kenya.[18] This increased result could be due to the variation of data collection period. Being more recent data, the information level of the population of our study participants is expected to be higher in the case of our study.

Table 4 List of Medicinal Plants Used for the Prevention and Treatment of COVID-19 Symptoms Among Visitors of UOGCSH, Northwest Ethiopia, 2021 (N = 423)

Type of Traditional Medicine	Local Name	Scientific Name
Essential oil	Nech Bahirzaf	*Eucalyptus globulus*
	Tikur Azmud	*Nigella sativa*
Herbal medicine	Zinjibil	*Zingiber officinale*
	Tenadam	*Ruta chalepensis*
	Fetto	*Lepidium sativum*
	Nech Shinkurt	*Allium sativum*
Home remedies	Zingibil (shay)	*Zingiber officinale*
	Lomi (shay)	*Citrus aurantifolia*
	Moringa (shay)	*Moringa oleifera*
	Haregresa	*Zehneria scabra*
	Damakese	*Ocimum lamiifolium Hochst*
Fumigation	Kebericho	*Echinops kebericho*
	Tinjut	*Otostegia integrifolia*
	Temenay	*Securidaca longepedunculata*

Table 5 Association of Independent Variables with Traditional Medicine Practice for the Prevention and Treatment of COVID-19 Symptoms Among Visitors of UOGCSH, Northwest Ethiopia, 2021 (N = 423)

Variables	Categories	Do You Use CAM for Prevention or Treatment of COVID-19 Symptoms		P-value
		Yes	No	
Gender	Female	219	1	0.516
	Male	201	2	
Age	18–34	255	3	0.587
	35–49	112	0	
	50–65	50	0	
	Above 65	3	0	
Religion	Orthodox	314	2	0.565
	Muslim	47	0	
	Protestant	59	1	
Educational status	Basic education	15	0	0.832
	College diploma	85	0	
	First degree and above	165	1	
	Primary education	25	0	
	Secondary education	80	1	
	Illiterate	43	1	
	Religious education	7	0	
Monthly income	1651–3200	69	0	0.047*
	3201–5250	54	0	
	5251–7800	36	2	
	7801–10,900	36	0	
	10,901 and above	17	0	
	No monthly income	43	0	
	Unknown monthly income	165	1	
Do you know the symptoms of COVID-19	Yes	412	2	0.000*
	No	8	1	
Have you ever experienced COVID-19 symptoms	Yes	145	2	0.056
	No	267	0	

Note: *P-value ≤0.05.

Regarding the source of information about COVID-19 signs and symptoms, most of the study participants use television as their primary source information followed by social media sources and this finding goes in line with other studies conducted in Ethiopia.[19]

Almost all (97.6%) of the study participants responded that they use traditional medicines for the prevention and treatment of COVID-19 related symptoms. The findings revealed that the population depends on traditional medicine for the treatment of COVID-19 related symptoms. The finding showed an increment than in studies conducted in Peru and Turkey, which showed the prevalence of the practice was 80.2% and 39.9%, respectively.[20,21] This increased result could be due to our study including the practice of traditional medicine for both treatment and prevention of COVID-19 related symptoms; on the other hand, the studies listed above assessed the traditional medicine used for symptomatic treatment of COVID-19.

Natural products such as home remedies and herbal medicines were among the reported practices with the highest frequency. This result also goes in line with the findings from the study conducted in Turkey which showed that herbal medicine is the most commonly used type of traditional medicine for the treatment of COVID-19 related symptoms.[21] Unavailability of modern medications for prevention and symptom treatment, the trust of the population for natural products, and the ease of preparation of home remedies could be the reason making them practice with the highest frequency.

Every method used by the study participants is supported by other studies done in different study populations. One of the relevant applicable medical manifestations of COVID-19 is the tremendous harm to the breathing tract, inflicting breathing difficulty which can cause death,[22] and for this reason, traditional medicine practices were required since modern drugs to cure the disease are not available.[23]

The major intention behind the use of medicinal plants during the period of COVID-19 pandemic was to manage the symptoms with the claimed antiviral property characteristics of the listed practices.[24] Products such as essential oils have been used for their antiviral and anti-inflammatory properties which include symptoms associated with COVID-19.[20,25–28] Some types of special diet supplementation such as vitamins, minerals, amino acids, and omegas also play a fundamental role in the treatment of respiratory symptoms, because the products trigger an immune response to respiratory viruses in addition to their regulatory activity in the inflammation caused by COVID-19.[29] Treating respiratory tract infections by traditional medicine is a common practice in every community. Plants such as ginger, rue (Tenadam), *Lepidium sativum* (Fetto), and garlic, *Nigella sativa* L. (Tikur azmud), seeds, slices of rhizomes of *Zingiber officinale* (Zinjibile), and juice of *Citrus limon* L. (Lomi) have been reported to be used as a treatment for symptoms associated with respiratory tract infections.[30]

Fumigation of home and environment can be employed for the treatment of respiratory symptoms.[31] Home remedies such as ginger tea, lemon tea, and moringa tea, Haregresa (*Zehneria scabra*), Damakese (*Ocimum lamiifolium hochst*) are the most commonly used home remedies to treat respiratory tract symptoms.[32]

Foods and diets that specially used in the case of respiratory tract infections are also one of the common modalities that are employed in the treatment of respiratory tract infections.[32] Our study also showed that food supplements such as honey, fruits and vegetables, soups, and spices have been used by the participants as treatment for symptoms associated with respiratory tract infections.

Practices of fumigation of the home and environment with herbal materials were used by about 34% of our study participants as management for COVID-19 related symptoms. This method has also been practiced and reported by different studies. Some local herbs reported by our study participants like kebericho, tinjut, and temenay were used for treatment purposes of respiratory tract symptoms.

The use of traditional medicines for preventive purposes of symptoms associated with respiratory tract infections and inflammatory reactions is also a common process among different groups of the population.[20,28] Indeed, the proper functioning of the immunity makes the body able to fight effectively against every kind of infection.[33] This is why it is essential to strengthen it to prevent and treat possible infections, such as colds, fever, shortness of breath, and sore throat, symptoms similar to those of this pandemic virus.[34] The findings from the current study also support this practice. The study participants, other than those who experienced the symptoms of COVID-19, took the traditional medicines for their preventive purpose. Herbal products such as *Allium sativum* L., eucalyptus, ginger, garlic, lemon, thyme, ginger, and honey were reported to have immunomodulatory properties in a number of in vitro and in vivo studies and can be used prophylactically in the prevention of viral infections.[33] Some herbal medicines such as *Moringa oleifera* have established in vivo and in vitro antiviral activity against Newcastle disease virus, HIV/AIDS, and herpes simplex virus type 1 (HSV-1).[35,36]

As for the socio-demographic factors associated with the use of traditional medicine for the management of respiratory symptoms related to COVID-19, our study reported that the monthly income (p = 0.047) and the perception of respondents about clinical symptoms (p value 0.000) have statistically significantly associated.

Limitations of the Study

The nonprobability of consecutive sampling method used to approach the study participants may raise some difficulties with inference findings for the general population. Another limitation might be the bias occurred as a result of the cross-sectional study design to determine definitive cause and effect associations. Our study participants are inclined to the young age that the virus was milder than elderly patients. This might affect the perception of the respondent and traditional medicine practice for the management of COVID-19 related symptoms. With these limitations, the findings of this study should not be undermined.

Conclusion

This study found that most of the respondents have heard about the COVID-19 pandemic and know the symptoms experienced by a person infected with this. The prevalence of traditional medicine use for the prevention and treatment of COVID-19 related symptoms was very high. The mostly used traditional or alternative medicines were essential oils, exercise or activities, and special and herbal medicines. Monthly income and perceived knowledge about chief clinical symptoms were statistically significantly associated with the use of complementary and alternative medicine for the management of COVID-19 and related symptoms. The investigators suggest that researchers should look into the medicinal herbs that were employed during COVID-19 for its management. Validity and reliability of therapeutic plants should be further evaluated through phytochemical and pharmacological studies about the bioactive compounds and the proper education about the rational use of traditional medicines should be given to the community.

Data Sharing Statement

The corresponding author has the dataset and will provide it upon reasonable request.

Author Contributions

Each author contributed significantly to the conception and design, acquisition of data, or analysis and interpretation of data; participated in the writing of the article or critically reviewed it for crucial intellectual content; agreed to submit to the current journal; finalized approval of the published version; and accept liability for all aspects of the work.

Disclosure

The authors affirm that they have no conflicts of interest.

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