

# Indigenous Knowledge of Medicine for COVID-19 or Related Disease in Benishangul Gumuz Regional State: Phenomenological Design

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**Purpose:** Coronavirus 2019 (COVID-19) is an acute respiratory viral infectious disease transmitted by respiratory and fomites. The incidence of this disease is growing exponentially and affects millions of the world population. Consequently, it has become most urgent public health risk. Thus, the intention of this research is searching indigenous knowledge on COVID-19 and related infectious disease prevention and mitigation mechanisms which were not scientifically known. Therefore, this study targeted to explore local traditional knowledge of (COVID-19) or related diseases in the study area.

**Methods:** Phenomenological design was used to explore traditional knowledge of medicine. The source populations were all elder peoples, who were known for their traditional medicine. The individuals were purposively selected from source population by using snowball sampling technique. Since study was qualitative method, the sample size was determined by the level of saturation of information as result 40 study participants were interviewed and recorded their audio using tape recorder. Then, data were analyzed using a thematic analysis with a combination of inductive and deductive methods.

**Results:** The study reveals that coronavirus like disease was appeared past times. Such diseases were called “*Alwoba*” or “*Marya*” which is named by the local language and it has similar signs and symptoms with coronavirus disease. The key informants reported that traditional medicines were available that cured those diseases. This study infers there had been COVID-19 related diseases about 100 years back because those diseases had a similar symptoms and ways of transmission with COVID-19. They use different types of traditional medicines for those diseases which have been inherited to generations and cured them.

**Conclusion:** This evidence explored that the existence of traditional medicine for COVID-19 related diseases. Hence, this study strongly suggested that to undertake experimental research for medical approval on the available traditional medicine.

**Keywords:** Covid-19, indigenous, knowledge

## Introduction

Coronavirus 2019 (COVID-19) is an acute respiratory viral infectious disease in human being caused by RNA virus that belongs to the family of coronaviruses, transmitted by respiratory and fomites.<sup>1,2</sup> It remains one of the leading causes of morbidity and mortality around the world, challenging both developed and less developed countries.<sup>3</sup> At the end of December 2019, World Health Organization was alerted to several cases of pneumonia infections in Wuhan City, Hubei Province of China.<sup>3</sup> The cause of the pneumonia was later identified as a novel coronavirus (COVID-19) because it was genetically close related to the Middle Eastern Respiratory Syndrome virus (MERS-CoV) and the Severe Acute Respiratory Syndrome virus (SARSCoV).<sup>3</sup> Later, it was labeled as SARS-CoV<sub>2</sub> with different strains of CORONA virus from SARS and MERS CORONA viruses.<sup>1,3</sup> The World Health Organization (WHO) has stated that COVID – 19 outbreaks as an international emergency. The incidence of novel coronavirus infections (COVID-19) is growing

exponentially and affects millions of the world population that leads to expose thousands of people to death.<sup>3</sup> This occasion is accelerated by human migration and delay in intervening mitigation strategies of COVID – 19 different countries.<sup>3,4</sup> Thus, during the outbreak emergence, one of the most urgent public health tasks is to prevent the spread of the virus from an epidemic source region to other regions within a country or globally.<sup>3</sup> Besides to prevent, emphasis has to be given on searching other creative solutions such as indigenous community knowledge of medicine.

Community knowledge refers to the knowledge and practices of local communities around the world. It is developed from experience gained over hundreds of years and changed to the local culture and transmitted from generation to generation orally.<sup>5</sup> Traditional medicine consists of knowledge received from the past and handed down from generation to generation.<sup>7</sup> It is collectively owned and takes the form of stories, folklore, proverbs, beliefs, rituals, community laws, agricultural practices and animal breeds. Today the value of indigenous knowledge is growing. This knowledge is valuable not only to those who depend on it in their daily lives, but also has a profound contribution to modern industry.<sup>5</sup> Indigenous medicine encompasses knowledge and practices used for diagnosis, prevention, and cure.<sup>7</sup>

As different evidences tell us, the indigenous knowledge and modern scientific knowledge is interrelated. Science and indigenous knowledge are probably closer to each which indicate indigenous knowledge is a foundation for scientifically proved knowledge. Indigenous knowledge and modern science can complement each other and until now, have convincingly been demonstrated in research on herbal medicine.<sup>8</sup> Traditional knowledge still matters because the learning trails that have led from indigenous knowledge to highly lucrative modern drugs and where the natural products have plant or animal origin, traditional knowledge has a good chance of being relevant.<sup>9</sup>

Today, the impact of COVID – 19 pandemic is not only distorting the health system but also it is aggravating social crises and economic disruption. The health crisis and economic recession that caused by a corona virus (covid-19) are engulfing the world.<sup>10</sup> World scientists and researchers are endeavoring to innovate preventive and curative mechanisms, but have not yet been reached to conclusion. This invites the need for further research and disclosing supportive alternatives that repose in traditional knowledge. The indigenous knowledge has been a springboard for innovation of medicine and pharmaceutical products depends on past discoveries, some of which have indigenous knowledge origins.<sup>9</sup> In a similar fashion, they could be the solution for COVID –19 infections using the traditional knowledge.

Ethiopia, being one of the developing countries trying to address the diverse needs of its people, is currently on the verge of the epidemic. The government is currently showing high commitment to control the epidemic before it causes significant damage to the community by designing and implementing different prevention strategies.<sup>1</sup> However, this could not be a long-lasting solution if curative medicine is unable to be investigated.

In spite of Benishangul Gumuz Region is one of the underprivileged and remote region in Ethiopia, there are diverse population characteristics in terms of culture and ethnic background. This diverse culture could have the potential of diverse knowledge of traditional medicine. In an attempt to prevent and control the disease, traditional knowledge is crucial. The community traditional knowledge still matters because the learning trails that have led from indigenous knowledge to highly lucrative to modern drugs and where the natural products have plant or animal origin, traditional knowledge has a good chance of being relevant.<sup>9</sup> In spite of this, there is no evidence that explored community traditional knowledge of COVID – 19 pandemics. Therefore, the objective of this study was to explore community indigenous knowledge and beliefs about the prevention and treatment of COVID – 19 infection in the region.

## Materials and Methods

### Study Setting

Benishangul Gumuz Regional State (BGRS) is one of the eleven Federal Regions of Ethiopia, situated in the north western part of the country. It shares boundaries in the north and northeastern with Amhara region, in the east with Oromia region, in the south with Gambella region and in the west with the Republic of Sudan.<sup>11</sup> Benishangul Gumuz National Regional State was carved from areas which had formed part of Gojjam and Wellega Provinces, to the north and south of the Blue Nile, respectively.<sup>12</sup> The land mass of the region is estimated to be 50,380km<sup>2</sup> stretching 9°35' to 11° 39' N latitude and longitude, from 34°20' to 36°30' E.<sup>12</sup>

## Study Design and Period

The phenomenological study design was conducted from June 10 to July 25, 2020 to explore the community traditional knowledge of COVID – 19 related infections.

## Source Population and Study Participants

Since the study was qualitative, the source populations were all the elder peoples, who are known for their traditional knowledge. Therefore, the study population was the individuals who were purposefully selected from the source population by using the snowball technique to have an in-depth investigation of community's knowledge.

## Sample Size Determination and Sampling Procedure

As the study was qualitative in its nature, the maximum sample size was determined by the level of information saturation. Accordingly, 40 study subjects were contacted for in-depth interviews.

## Data Collection Process and Quality Assurance

The actual data collection was conducted by the principal investigator and co-authors. The interview was made within the home or outside the home, which was convenient to maintain the privacy and confidentiality of the study participants. Hence, the principal investigator and co-authors conducted in-depth interviews using in-depth interview guideline and tape recorder. Finally, the conversation was transcribed verbatim after each session and then analyzed on time.

The data quality was ensured by verification of the content of manual transcripts by audio-recording, review, and debriefing sessions with the study participants before departing from the key informants. The interview was recorded with Amharic and transcription was made, then after, it was translated into English, transcribed verbatim and coded.

## Data Management and Analysis

After completing data collection and ensuring quality of data, the data were read several times to create the themes. This process of refining codes: combining codes of like concepts and expanding the properties of each coded concept, continued until no new concepts emerged, and then the final coding of codes was established. Then, thematic analysis with a combination of inductive and deductive approaches was employed to analyze the data. Finally, narration and striking quotations were used to describe the finding.

## Results

As the prior information about a problem is crucial in searching the solution, we were obliged to begin with the status of information availability on COVID-19 infection before assessing traditional medicine for it. As a result, awareness about COVID-19 has become our first theme. The second theme was about past experiences of interviewees about COVID-19 related diseases. The next, third, and fourth themes were the types of traditional medicine and causes of the disease, respectively. Lastly, prevention and care mechanisms and opportunities and challenges to apply the controlling mechanisms were becoming the fifth and sixth themes, respectively. Thus, the result is presented in six themes as follows.

### Theme - I. Awareness/Information/to COVID-19

Among the interviewees, there were people that had much information about COVID-19 infection. During the time of the interview, most of them accessed for information about COVID-19 infection by radio, while in the past information about COVID-19 like disease was transmitted orally from generation to generation. In Sharkole woreda, a 78 -years-old man had sufficient information about the coronavirus;

It is an international and pandemic as he heard on television. The prevention is washing on time and using alcohol, avoiding contact with people. The symptom is coughing, high temperature, throat pain, and breathing problems. It is transmitted by breathing, contact of materials, sick person's, etc.

In spite of having sufficient information about corona virus, he had known nothing about traditional medicine about corona virus. Of course, it is not expected that all traditional medicine owners know/pose/ a medicine for every disease.

Similarly, the other interviewees in Metekel zone informed that they had sufficient information about COVID-19 diseases. They responded “*COVID-19 symptoms are coughing and lack of breathing and acute and then killing*”. The other interviewees in Metekel were also with enough information about COVID-19 transmissions and symptoms, as they heard on TV. The information they obtained as it causes difficulty of breathing and sore throat. They know that it is transmitted from one person to another person while breathing and sneezing.

## Theme - 2. Experience of Interviewees with Corona Related Disease

According to one of the interviewees in Sharkole woreda, coronavirus like disease was appeared in the past. He said that his father informed him;

In past times the symptom was headache, sneezing, and throat pain, and finally it kills like as current corona situation. In local language in the community, coronavirus like disease was called “*alwoba*”. It was appeared during the Hail Sillase period - estimated to be 80 years ago back. Its transmission way was mainly contacting with the infected people. Even those who buried dead people with the diseases were used to be caught by the disease. At that time, people were not such caution to avoid contact so that many people were infected and passed away.

Another interviewee told us, the disease with similar features to COVID-19 infection had appeared in the previous time, which killed a number of people in the community which they called “*Marya*”, in Shinasha people. As they had been informed by their elders, the clinical manifestations of “*Marya*” include diarrhea, fever, and coughing.

The Corona related disease was existed in the past. It was called *Marya* in the local language. It is transmitted by contact so that if someone affected no one to contact the infected people it is in the distance that you call him/her even to supply food. Uninfected people didn't provide food to the infected people hand to hand to avoid physical contact and keep physical distance. If one member of a family or village is infected, it immediately spreads throughout and destroys life. Its symptom was mainly coughing, then diarrhea and finally killed.

The other interviewees responded that such related disease was appeared for the second time in their life time. Accordingly, if someone was affected by the disease, no one physically approached him/her; even food was provided at a distance.

The disease stays from two weeks to a year in someone's body if affected. Some people might be highly sick and recovered while others died. Neighbors do not visit the sick people/family/because the disease transmits from the infected people. If the occurrence of the disease is heard near a neighbor, unaffected people migrate to the forest to escape from the disease. Migrating to the forest at a distance was one of the prevention mechanisms for the disease. The symptom was sleeping, coughing, and diarrhea. It did not affect children relative to the old men.

As one of the informants narrated the difference between that disease/*Marya*/ and Covid 19, in the case of COVID 19, there is lack of breathing and acute, while the former one was not acute.

The other interviewee responded that his grandfather, whose age was about 130, was informed that such a disease had appeared about 120 years ago. He described that corona-related diseases had appeared in the time of their ancestors. It was called *Marya* in the local language of Shinasha.

If someone was known as affected by the disease, no one had to contact him or her physically. Food and medicine were given by the long sticks to avoid contact. It kills within a month. After a month, the sick people get recover.

Similar idea was also narrated by the other informants as follows;

The corona was called *Marya* in the past by local language. It highly attacked older people. It was transmitted by breathing and physical contact. The symptom was coughing like common cold and diarrhea. It was appeared in the past time of our ancestors.

### Theme – 3. Types of Traditional Medicine

According to one of the informants, the available curative traditional medicines for the disease were five types which are found in leaves, roots, and parasitic/xerophytes/ plant. Two types of traditional medicine are given by syringe via nose at two cc and the other two types are given by mouth. The fifth is smoking in houses for two to three days. Two of these medicines also use to heal asthma disease. He has full confidence that his medicine can cure the infected people by corona.

When this medicine is taken, it has no any side effect, but they are allowed not to eat raw meat, drink alcohol, and have sexual intercourse until they cure from the disease.

If he is going to give the medicines to the patients, he promised that first he should test for himself by drinking to show the medicine has no side effect. The medicine has to be taken for ten days to cure. He narrated that the medicine for such disease was shown by his grandfather. Then he expanded his knowledge based on experimenting. Based on the symptoms he observed and heard, he was enough sure that the disease, COVID 19 is completely what it was locally called *Marian* pasttime. The disease has highly affected older people more than 40 years than youths.

The other respondent's idea is also narrated as follows;

Besides to prey on good, there is medicine that used to cure such disease. There was medicine used to cure. If someone is infected, the medicine is smoked in house. The medicine was that to be smoked in the respective houses.

On the other hand, the other responds in Sharkole woreda described that there were three types of medicine that the ancestors used to prevent and to recover from the COVID like disease- called "*Alwoba*"; the one which is given by nose; the second is given orally to treat throat pain; and the third was combustion and releasing smoke in the house. The third one was more effective than the others because the smoke disseminates in the air and minimizes the spread of the disease. This idea infers the concept that *alwoba* was an air born disease because smoke in the airway prevents the disease.

The intention of smoking medicine in the house everybody was to avoid the pollution of air. For individual sick people, it is given orally or by nose or covered by close and combusted under the close. The medicines are the roots of the tree and xerophytes.

Although it has not been medically tested, the medicine has no negative effect on the patient. The owner of medicine assured that he can test upon himself before offering to patients. These medicines were transferred from his grand father to him. His grandfather inherited it to his father and his father to him/ current owner of traditional medicine/. Thus, his father oriented him about traditional medicine when and how to use it. The medicine is known and available in the woreda.

### Theme – 4. Causes of Similar Disease/Marya or Alwaba/

Its cause was under investigation by the traditional medicine owners. Some of the respondents were considered "*Marya*" as a punishment sent from the God to bad persons which were considered as not loyal to the rule of God. Its morbidity and mortality rates were significantly higher in peoples which are considered as bad. According to their perception, the only chance to escape or get relief from the case was letting their bad practices and waiting to apologize from the Gods. The interviewees had also mentioned as this "*Marya*" had not affected children.

### Theme - 5. Prevention and Care Mechanisms of Similar Disease/Marya or Alwaba/

The car that had been practiced to prevent or control of the disease considered as "*Marya*" was the strict isolation of patients, even the movement was restricted to/in the village from where the presence of the disease was identified.

When a person had a history of travel to the village where there was an occurrence of disease, he/she was not allowed to enter to the communities which were considered as free from the case; Rather, they stay away from those communities and wash all their body parts thoroughly in the river by using local detergents called the bark of "*lenquanta*" tree.

Regarding the prevention and control measures of COVID-19, they are more preferred to prevent corona virus infection through the application of traditional practices rather than the way that was recommended or suggested by health professionals. The traditional/cultural prevention or control measures that they put under practice were more of belief based including the neighbors gathered in a group at the selected free/communal land/ which might be near by the road and pray with the group through washing their hands and other cultural practices. In the group, elders are elected/ represented/ from three known clan members known to have traditional knowledge, namely “*dowo, enoro, and endiwo*” were expected to lead the blessing. In addition, they practice smoking in their houses and residential areas by using different plant leaves, bark, stems and roots which are believed to be curative and preventive by the peoples (shinasha people). They consider that by doing so, COVID-19 could be prevented from entering their house as well as their village.

## Theme – 6. Opportunities and Challenges to Apply the Controlling Mechanisms in Past

According to informants saying, the events considered as opportunities for the ease of application of the measures designed to apply; limited number of people in a particular village to access all individuals with care and prevention; dispersed/scattered/ population density and limited means of transportation across the country as well as worldwide as a result of the transmission rate were slow for someone to other.

In contrast, they forwarded the events like current high density of population in a particular village, diversified/uncontrolled means of transportation nationally as well as internationally, and negligence among the people would challenge the designed application mechanisms and its effectiveness. However, they believe that if their traditional way of prevention measures will be appropriately applied, COVID-19 could be effectively prevented. It was considered as treatment is more difficult than prevention, even eradication of the case could be impossible, so they preferred to the possibility of preventing or limiting the case from entering their community.

## Discussions

This study aimed to explore the community indigenous knowledge on COVID-19 and related diseases in the local context in the Benishangul Gumuz Regional State. As evidence explored that the knowledge of indigenous peoples across the world plays a unique and valuable role in sustainably managing a significant share of the world’s scientific knowledge and innovation of modern technology.<sup>6</sup>

This study found that people had much information about the COVID-19 infection. During the time of the interview, most of them accessed for information about COVID-19 infection by radio. In addition to radio, the local government was introducing the COVID – 19 infections to the community. Therefore, from the interview it can be concluded that the majority of respondents have sufficient information about the disease. They justified their access to the information by telling “*COVID – 19 symptoms like coughing and difficulty of breathing and acute coughing, headache, throat problems and then killing*”. They also heard its transmission and symptoms. Thus, according to the response of the interviewee, the community had already been informed about the corona virus regarding its signs (coughing, respiratory problem, and headache), means of transmission (contact, breathing, poor hygiene) and prevention/control measures (social distancing, avoiding of greeting by contact, washing of hands, using sanitizers and disinfectants). Thus, it could be inferred that the community had already been informed about the corona virus regarding its signs (coughing, respiratory problem, and headache), means of transmission (contact, breathing, poor hygiene), and prevention/control measures (social distancing, avoiding of greeting by contact, washing of hands, using sanitizers and disinfectants).

Corresponding to experience of interviewees with corona related disease, this study found that coronavirus-like disease was appeared in the past time. The corona-like disease is so called “*Alwoba*” which is named by the local language of the community and it has similar signs and symptoms with corona disease such as headache, sneezing, and throat pain then finally it killed. Moreover, the modes of transmission and prevention modality were similar to corona disease. The disease with similar features to COVID–19 infections had appeared in the previous time, which killed a number of people in the community which they called “*Marya*”, in Shinasha people. As they had been informed by their elders, the signs and symptoms of “*Marya*” included diarrhea, fever, and coughing and it is transmitted from an infected



person to health people via close contact. As a result, food and water were provided for infected people at a far distance. Thus, as a prevention modality used for corona-like disease which appeared in the past was avoiding close contact and maintain physical distance. Besides, if someone was affected by the disease, no one physically approaches to him/her, food was provided at a distance level. Therefore based on the informant's information, what has to be inferred from this is that there has been COVID 19 related diseases in the past times because there is a similarity of symptoms and ways of transmission between what they call Marya/Alwaba/ and COVID-19. This finding should not be undermined because as a study done in United Kingdom local knowledge can be a useful source of new information about human diseases.<sup>13</sup>

Other thematic of this finding was the types of traditional medicine used for coronavirus-like disease in the past times and their hypothesis for their current COVID-19 pandemics. Hence, the informants reported that the available curative traditional medicines for the disease were five types: three of them were found in leaves, roots, and parasitic/xerophytes/plant, one of them were formulated in the form of fluid like traditional medicine, which offered by syringe via nose at 2cc/mL and via mouth and the last one was chimney like that used fumigation of the houses for two to three days. The last two of the traditional medicines were also used to heal or treat asthma disease. Although it needs medical/scientific/experiment, those traditional medicines didn't have any side effect on human health and also, they had full confidence on the medicine that will cure the disease after the medicine is prescribed for ten days. The sources of medicine were the roots of the tree and xerophytes that inherited from their ancestors. This evidence is supported by different literatures such that community knowledge refers to the knowledge and practices of local communities around the world. It is developed from experience gained over hundreds of years and changed to the local culture and transmitted from generation to generation orally.<sup>5</sup> Traditional and indigenous medicine consists of knowledge received from the past and handed down from generation to generation.<sup>7</sup> It is collectively owned and takes the form of stories, folklore, proverbs, beliefs, rituals, community laws and agricultural practices and animal breeds. Today, the value of indigenous knowledge is growing. This knowledge is valuable not only to those who depend on it in their daily lives, but also has a profound contribution to modern industry.<sup>5</sup> Indigenous medicine encompasses knowledge and practices used for diagnosis, prevention, and cure.<sup>7</sup>

Although for the moment it has not been medically tested, the medicine has no negative effect on the patient- the owners of the medicine assured that they can test upon themselves before offering to patients. These medicines were transferred from their grandfathers. Their grandfather inherited it to them/current owner of traditional medicine/ via their fathers. They were oriented about traditional medicine when and how to use it. This evidence, consistent with different literature, tells us the indigenous knowledge and modern scientific knowledge is interrelated. According to Kamla-Raj,<sup>8</sup> science and indigenous knowledge are probably closer to each. He wants to indicate that indigenous knowledge is a foundation for scientifically proved knowledge. Indigenous knowledge and modern science can complement each other and until now, have convincingly been demonstrated in research on herbal medicine.<sup>8</sup> Traditional knowledge still matters because the learning trails that have led from indigenous knowledge to highly lucrative modern drugs and where the natural products have plant or animal origin, traditional knowledge has a good chance of being relevant.<sup>9</sup> Today, the health crisis and economic recession that caused by a corona virus (COVID-19) are engulfing the world.<sup>10</sup> World scientists and researchers are endeavoring to innovate preventive and curative mechanisms, but have not yet been reached the conclusion. This invites the need for further research and disclosing supportive alternatives that repose in traditional knowledge. The indigenous knowledge has been the spring board for innovation of medicines. Pharmaceutical productiveness depends on past discoveries, some of which have indigenous knowledge origins.<sup>9</sup> In a similar fashion, there they could be the solution for COVID -19, seating and discovering the traditional knowledge of the community. Thus, in short, it can be put that there are different forms of traditional medicine for COVID19 like a disease that has been inherited to generation. The medicines are found in leaves, roots, and xerophytes which are taken through the nose, oral or in fumigation form. Of course, the final conclusion shall be claimed after the clinical experiment is conducted.

The other theme was the cause of a similar disease, so called "Marya" or "Alwaba". Its cause was under investigation by the traditional medicine owners. Some of the respondents were considered "Marya" as the punishment sent from the God against bad persons which were considered as not loyal to the rule of God. Its morbidity and mortality rates were significantly higher in peoples which are considered as bad. According to their perception, the only chance to escape or get relief from the case was letting their bad practices and waiting to apologize from the Gods. The interviewees had also

mentioned as this “*Marya*” had not affected children. However, this could be difficult scientifically to conclude whether right or not.

As the concern to the prevention mechanism of COVID-19 similar disease so called “*Marya*” or “*Alwaba*”, there was strict isolation of patients, even the movement was restricted to/in the village from where the presence of the disease was identified. Even a person who had a history of travel to the village in which the case occurred, he/she was not allowed to enter to the community. Moreover, using other prevention and control measures of COVID-19, they are more preferred to prevent corona virus infection through the application of traditional practices. The traditional/cultural prevention or control measures that they put under practice were more of belief based: the neighbors gathered in the group at the selected free/communal land/ which might be near by the road and pray in the group through washing their hands and other cultural practices. In the group, elders are elected or represented by the three known clan members known to have traditional knowledge namely “*dowo, enoro, and endiwo*” were expected to lead the blessing. In addition, they practice smoking in their houses and resident areas by using different plant leaves, bark, stems and roots which are believed to be curative and preventive by the peoples, particularly in Shinasha people. They consider that by doing so, COVID-19 infections could be prevented from entering their house as well as their village. The community could have culture of hand washing, isolation, and fumigation of the house and village to prevent the disease. What substance existed in the leaves, roots, and barks of the tree might be of the secret behind in preventing the disease, although medical investigation is the need to conclude like that. This finding is consistent with the study done in Remote Peruvian Amazon revealed that almost all communities instigated rules prohibiting entry of non-residents, including family members, social isolation, exit restriction, social distance within the community and avoid physical contact for the purpose of prevention mechanism of COVID – 19 infection.<sup>14</sup> Similarly, a different qualitative research reviews supported this finding.<sup>15</sup>

Moreover, spending time in nature can be both a preventive and a therapeutic approach that makes use of the targeted effects of natural stimuli in forests, urban green spaces, and therapeutic landscapes to promote health related self-regulation mechanisms in individuals and communities.<sup>16,17</sup> Nature and forest therapy represent a simple, easily accessible, low cost, sustainable, and effective supportive method for improving health parameters. Especially in the current pandemic nature therapy can be important, because it can be practiced in the open air and individually. Therefore, these measures will most likely play an important role in preventive medicine in the near future.<sup>18</sup>

The last theme was found to be opportunities and challenges to apply the controlling mechanisms in the past and present. In this regard, informants reported that the events considered as opportunities for the ease of application on the measures designed to apply; limited number of people in a particular village to access all individuals with care and prevention; dispersed/scattered population density and limited means of transportation across the country as well as worldwide as a result of the transmission rate was slow for someone to other. In contrast, they forwarded the events like current high density of population in a particular village, diversified/uncontrolled means of transportation nationally as well as internationally, and negligence among the people would challenge the designed application mechanisms and its effectiveness. Of course, this is an undeniable fact exiting on the ground. However, they believe that if their traditional way of prevention measures will be appropriately applied, COVID-19 could be effectively prevented. It was considered as treatment is more difficult than prevention, even eradication of the case could be impossible, so they preferred for the possibility of preventing or limiting the case from entering in to their community.

## Conclusions and Recommendation

It could be inferred that the community had already been informed about the corona virus related disease regarding its signs, means of transmission and prevention/control measures. This study also found that indigenous community knowledge, particularly the knowledge of traditional medicine of the people in the region was found to be diverse. Some specialize in a certain kind of medicine while others were owned by the other type. Based on the informants, what has to be inferred is that there has been COVID-19 or related diseases in the past times because there is a similarity of symptoms and ways of transmission between what they call *Marya/Alwaba/* and COVID-19. However, its cause was under investigation by the traditional medicine owners. As a concern to the community knowledge of medicine, in short, it can be put that there are different forms of traditional medicine for COVID 19 or like a disease that has been inherited to generations. The medicines are found in leaves, roots, and xerophytes which are taken through the nose, oral or in



fumigation form. Of course, the final conclusion shall be claimed after the clinical experiment is conducted. What substance existed in the leaves, roots, and barks of the tree might of the secret behind in preventing the disease, although the medical investigation need to conclude like that. The community could have culture of hand washing, isolation, and fumigation of the house and village to prevent the disease.

Therefore, this study strongly recommended that clinical trials on the available traditional medicine for COVID – 19 infections should be conducted by further investigators to prove what has been obtained from the community orally.

## Abbreviations

BGRS, Benishangul Gumuz Regional State; COVID – 19, Coronavirus disease 19; FABGR, Fact About Benishangul Gumuz Region; FMOH, Federal Ministry of Health; MERS-CoV, Middle Eastern Respiratory Syndrome virus; SARSCoV, Severe Acute Respiratory Syndrome virus; UNDP, United Nation Development Program; WHO, World Health Organization.

## Data Sharing Statement

All data generated or analyzed during this study are included in this article.

## Ethics Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki regarding ethical and consent concerns. The research informants were informed about over all objectives of the study and the interview was conducted after they agreed to participate.

Before participant consent, this study was evaluated and approved by a review board of Assosa university on date of 06/05/2019 with protocol number 5451/ASU/04/12. Then, Regional Health Bureau provided formal approval letters to their respective local administrative offices. Before endorsing actual data collection, written informed consent as well as verbal consent were obtained from each study participant. Finally, we want to assure that participants were well informed about the legality of the research and their consent was acquired. The consent form is attached as [Supplementary Material](#).

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## Author Contributions

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

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## Disclosure

The authors declare that they have no competing interests in this work.

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