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Practice of Novel Coronavirus SARS-CoV2 Pandemic Precautionary Measures in Selected Three Onchocerciasis Endemic Urban Areas of Ethiopia

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ABSTRACT

Background: The human body can become infected with a Coronavirus disease through the mouth, nose, and eyes. It is contagious and spreads through cough droplets, sneezes, and direct contact. The disease is extremely contagious and has quickly spread to almost all countries in the world. It has a devastating impact on human life in both developing and developed countries. Basic precautionary measures for the novel Coronavirus SARS-CoV2 pandemic were created and practiced in coordination with these countries to slow infection spread and subsequently bring it under control. In demand to learn mitigation efforts, this study aims to assess the extent to which these basic precautionary measures are put into practice at the community level.

Methodology: A cross-sectional survey that employed both quantitative and qualitative methods was carried out in three onchocerciasis-endemic urban areas of Ethiopia. The survey contained a closed-ended, structured questionnaire used to gather information on socio-demographic data, knowledge, behavior, and attitude towards novel Coronavirus SARS-CoV2 pandemic precautionary measures. Key informant interviews were also conducted to produce more significant data regarding mitigation efforts and the practice of precautionary measures at the community level.

Result: Almost all (99.6%) of the survey participants were aware of the novel Coronavirus SARS-CoV2 pandemic. Reportedly, in urban areas and during Ivermectin treatments, hand washing (72%) and maintaining physical distance (66%) are the precautionary measures most frequently practiced respectively. The mean difference is between 2.938 and 3.159 with a confidence interval of 95% lower and upper bounds of the scale range from 2.85 to 3.24, which agrees with the scale level "practice sometimes" that indicates the overall level of practice of precautionary measures in chosen urban areas. According to the 70.6% of participants who agreed that maintaining physical distance is an essential precautionary measure to prevent the novel Coronavirus SARS-CoV2 pandemic in the study area.

Conclusion: Participants in the study are aware of the novel Coronavirus SARS-CoV2 pandemic's prevalence and its precautionary measures, such as physical distance, social distancing, hand washing and sanitizing, wearing face and nose masks, etc. Even though some precautionary measures are most frequently practiced, their implementation depends on the circumstances and environments for which they are suitable and applicable.

Keywords: Coronavirus; Pandemic; Precautionary; Measure; Onchocerciasis

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BACKGROUND

The World Health Organization (WHO) declared the 2019 novel Coronavirus disease (novel Coronavirus SARS-CoV2) to be a pandemic on March 11, 2020, after the first Coronavirus SARS-CoV2 case of the year was discovered on December 12, 2019 [1,2]. On May 19, 2022, two years after the pandemic began; more than 525 million individuals had been infected, with more than 6.2 million fatalities and more than 23.8 million active cases worldwide reported [3]. Similarly, the pandemic has afflicted more than 4,70,000 individuals in Ethiopia, where 7,510 deaths and 7,575 active cases have been documented nationwide on the same day [4].

Coronaviruses cause multiple system infections in various animals and mainly respiratory tract infections in humans, such as Severe Acute Respiratory Syndrome (SARS), and Middle East Respiratory Syndrome (MERS). In the past, with both pandemics, most patients had mild symptoms and a good prognosis. However, the current pandemic, the novel Coronavirus SARS-CoV2 pandemic, is associated with severe pneumonia, pulmonary edema, Acute Respiratory Distress Syndrome (ARDS), or multiple organ failure, and death. It is an airborne virus that enters the human body through the nose, eyes, and mouth. It spreads through cough droplets, sneezing, and contact with infected objects. The symptoms of Coronavirus disease are currently defined as fever, chills, cough and shortness of breath, muscle discomfort, sore throat, or loss of taste or smell [5,6].

The world has been aware of Coronavirus disease since 2002/03, with the outbreaks of severe acute respiratory syndrome Coronavirus (SARS-CoV), and middle-east respiratory syndrome Coronavirus (MERS-CoV) in 2012. The novel Coronavirus SARS-CoV2 was identified as a highly contagious disease and declared a global public health emergency by the World Health Organization [7,8]. It has been affecting the health, economy, social, and many other sectors in all countries, establishing challenges directly or indirectly by disrupting the global economy.

The novel Coronavirus SARS-CoV2 pandemic has seriously disrupted the healthcare systems of many countries worldwide, especially in developing countries are combating diseases that promote poverty, like neglected tropical diseases, and which must immediately recommence the prevention, control, and elimination of these diseases. Even while actions like locking down have delayed or skipped rounds of treatment for neglected tropical diseases prevented by preventative chemotherapy, the endemic countries of the world have consequently responded to resume neglected tropical disease activities by developing a mitigation plan for the pandemic. In addition to this, the pandemic required more resources and innovative public health strategies to be successful in halting transmission and saving the lives of those who were at risk [9-14].

Neglected tropical diseases like onchocerciasis, trachoma, lymphatic filariasis, schistosomiasis, and soil-transmitting helminths can be treated in Ethiopia with preventative chemotherapy. Depending on the control or elimination strategies of the programs, these Neglected Tropical Diseases (NTDs) require treatment once or twice a year. In demand to resume NTD's operations safely, endemic countries have developed a standard operating procedure based on the WHO interim guidance [9]. Due to this, almost all countries resumed their NTD efforts along the fight against the novel Coronavirus SARS-CoV2 pandemic in an effort to slow or stop its spread [15].

…despite the challenges posed by the COVID-19 pandemic, MOH is committed to deliver safe MDA by putting all the necessary precautionary measures in place, in a way that ensures both the community and MDA service delivering health personnel are not put at risk of potential exposure to the virus [16].

The prevention and control of the novel Coronavirus SARS-CoV2 pandemic have been the focus of efforts from the government, non-governmental organizations, community-based organizations, and others. As part of these initiatives, hand washing, wearing a nose and face mask, hand sanitizing, maintaining a physical distance, and other precautionary measures have been promoted as widespread precautions. Health education and information can affect people's behavior since a low understanding of disease prevention strategies may be linked to high infectious disease transmission. Those with higher knowledge of the disease prevention and transmission mode were better able to put precautionary measures into practice than those with less information. In general, health education efforts have shown that people's knowledge levels are directly correlated with their willingness to act in agreement with precautionary measures [1,17,18].

Programs for the elimination of onchocerciasis necessitate the administration of ivermectin in vast quantities to a large population. When people have received ivermectin treatment, effective preventative measures should be taken to reduce the novel Coronavirus SARS-CoV2 pandemic and prevent it from spreading. Additionally, it's crucial to ascertain which preventive measures are most frequently implemented, appropriate, and effective under specific conditions, as well as how widely they are practiced.

MATERIALS AND METHODS

Study area and population: The three urban areas included in this study, Bonga, Shebe, and Mizan-Aman are located in the southwest part of Ethiopia. The global positioning system coordinates from the centres of towns for Bonga are: Latitude 7.265266, Longitude 36.245670, Mizan-Aman, latitude 6.993921, longitude 35.591813, and Shebe, latitude 7.503375 and longitude 36.507066. All three urban areas are located in the humid and moderate temperature climatic zone and 1500 meters above sea level. According to the Central Statistics Agency, the total population of the towns of Bonga, Mizan-Aman, and Shebe in 2021 was 36368, 55042, and 11248 respectively [19].

Study design and sampling: The acceptance and implementation of novel Coronavirus SARS-CoV2 pandemic precautionary measures were assessed using mixed method techniques. Using the single population proportion calculation, a sample size of 450 individuals was determined by taking into account the 50% prevalence, 5% desired precision, and a 95% confidence interval (CI) with a design effect of 1.18. According to the number of villages in the three urban areas, the complete sample for this study was divided among them. 150, 210, and 90 participants were selected from the urban areas of Bonga,

Mizan-Aman, and Shebe respectively. Due to inconsistencies in the participants' ages that were discovered during data cleaning, four individuals' data were deleted from statistical analysis data.

Three purposely chosen Onchocerciasis-endemic urban areas served as the primary sampling units for the survey, which practiced a multi-stage sampling methodology. The study covered all the villages in the chosen towns, that is, the seven villages in the Mizan-Aman town, the five villages in the Bonga town, and the three villages in the Shebe town. There were fifteen communities involved, and samples were distributed equally among them. House heads were chosen systematically from the total number of dwellings in the chosen communities. Although the total number of houses and density varied from village to village, the ten-house interval technique was used to select a household without double counting as taking into consideration the urban setting. Starting from whichever location in the village was most convenient for them, the data collector used the lottery method to select one eligible respondent from among the residents of the chosen house.

The qualitative survey was conducted from January 15, 2022, until March 21, 2022. A total of 20 people who had a role in the novel Coronavirus SARS-CoV2 pandemic prevention were selected for the key informant interview. Participants in the project were selected from beneficiary communities, health posts, district health offices, zonal health departments, and regional health bureaus. Each interviewee received an identification number before the conversation began. The interview was carried out in both Amharic and Afan Oromo, and all data was recorded in line with the key informant interview questions.

Data analysis: The open data kit (ODK) was used to collect questionnaire data, and SPSS Version 25 was used for statistical analysis. The statistical analysis of descriptive frequency and descriptive statistics were used to analyze and present the percentage of simple frequencies of the dependent variables and compare the means of a one-sample t-test for verbal frequency to measure level of agreement with the precautionary measures of practice respectively. The thematic presentation was employed to develop a scrutinized summary of qualitative findings to triangulate with quantitative data and determine whether the findings were similar, inconsistent, or complementary to each other.

Ethical clearance: The Institutional Review Board of the Ethiopian Public Health Institute (EPHI-IRB, 370-2021) granted ethical approval to conduct a study in the chosen urban areas, and letters of support were obtained from the Ministry of Health and the Regional Health Bureaus in addition to the ethical approval. Each participant in the study has given written, informed consent.

RESULT

Socio-demographic data: A total of 450 people from 15 villages selected among the three towns were involved. Each village has a total of 30 individual quotas. The minimum and maximum ages are 18 and 60 respectively. The mean age is 31.66, with a standard deviation of 9.230. Women made up 60.3% of the participants. More than 90% of participants had attended primary school or higher. The majority of participants, 78.3%, were married. Housewives made up 32.7% of the participants, followed by merchants and private employees (26.9%), and government workers (19.1%). The remainder was divided among farmers, the unemployed, those not working, and others. Four people's data were deleted from SPSS due to inconsistencies in their ages discovered during data cleaning.

General awareness: The majority of survey participants (99.6%) were aware of the existence or prevalence of novel Coronavirus disease. 85%, 50%, and 61.4% of the participants indicated that cough droplets, sneezing, and contact with infected objects were the three main ways that the disease was spread from an infected person to a healthy person. All study participants were aware that the novel Coronavirus SARS-CoV2 can spread through one of three modes of transmission from an infected person to a healthy person (**Figure 1**).

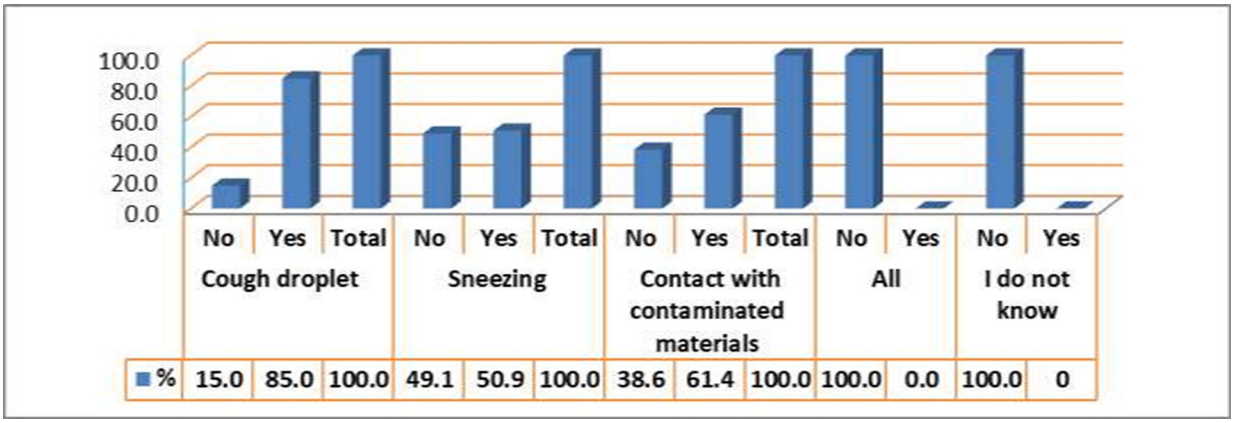


Figure 1: Mode of transmission of the novel Coronavirus SARS-CoV2

Most people (80%) think that the mouth is the main entry point for the novel Coronavirus SARS-CoV2. 19.3% of the participants, however, were unsure whether the mouth serves as a point of entry for the novel Coronavirus SARS-CoV2 or not. Only 18.2% of participants say that the eye is one of the portals of entry for the novel Coronavirus SARS-CoV2, and 81.1% of participants say that the eye is not a portal of entry. According to 73.1% of participants the nose is second to the mouth as one of the portals of entry for the novel Coronavirus SARS-CoV2, The mouth and the nose, which accounted for 80.7% and 73.1% respectively, in the response, are the main entry points for the novel Coronavirus (**Figure 2**).

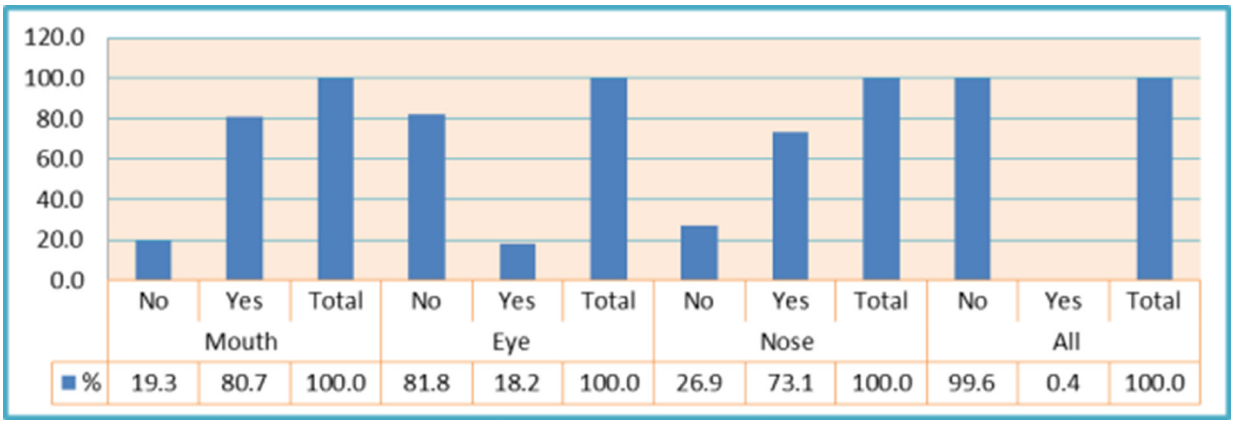


Figure 2: Portal of entry for the novel Coronavirus SARS-CoV2

The qualitative summary revealed that there was interest in the collaboration of various organizations and sectors in the information dissemination:

…in the early stages of the pandemic (COVD-19), the participation of community and faith-based organizations, mass media, and various sector organizations in education and information dissemination made providing technical and material support for the COVID-19 Taskforce too appealing.

The most frequently practiced precautionary measure: As stated in the study, in the urban communities of Mizan-Aman, Bonga, and Shebe towns, a high proportion (72%) of community members practiced hand hygiene to reduce novel Coronavirus disease transmission, while other important measures such as wearing nose and face masks and maintaining physical distance accounted for 57% and 61% respectively (**Figure 3**).

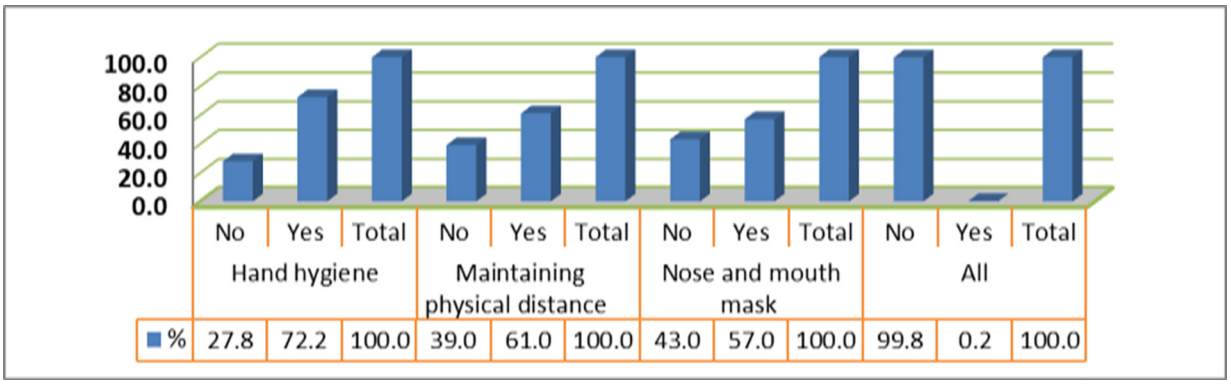


Figure 3: Which precautionary measure is most frequently practiced in chosen community?

According to the statistics, a person had the option to take various precautionary measures as needed. Prior to data collection, ivermectin treatment was implemented based on the novel Coronavirus SARS-CoV2 pandemic protocol in the study areas [16]. In these areas, maintaining physical distance was reportedly the most frequently practiced novel Coronavirus SARS-CoV2 pandemic precautionary measure at the time (66%). The percentage of respondents who reported using nose or mouth masks, hand hygiene, or both was 31.6%, 25.3%, and 2.5% respectively (**Figure 4**).

A key informant interview has indicated that keeping physical distance is the precautionary measures that are most frequently practiced during ivermectin treatment in their area:

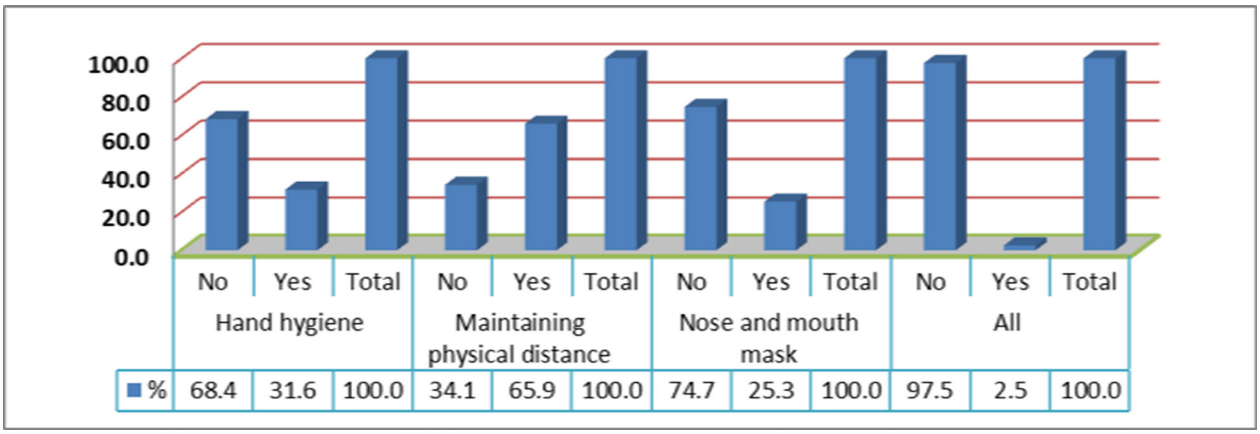
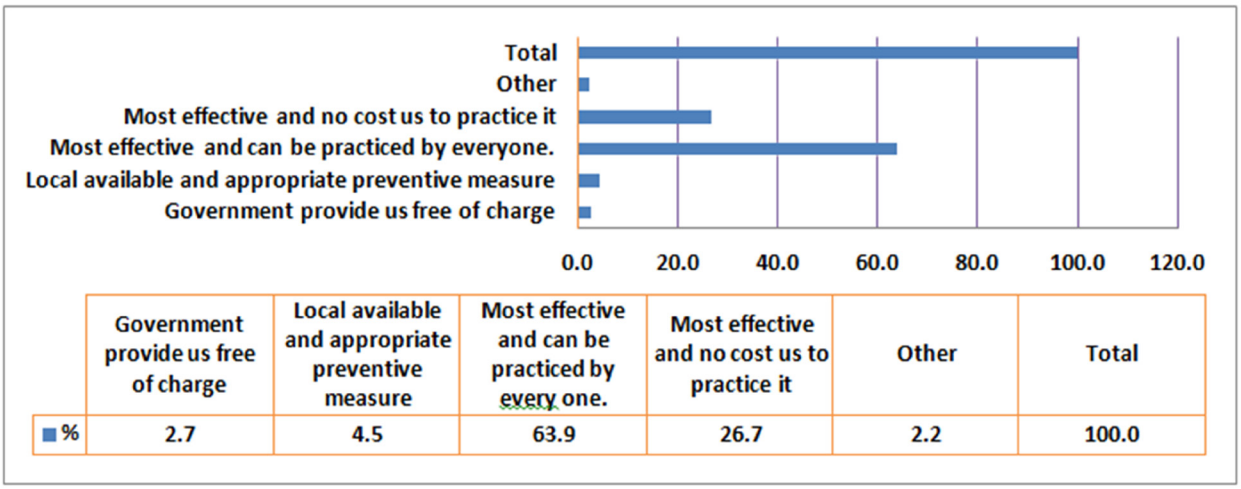


Figure 4: Which precautionary measure is most frequently practiced when treating onchocerciasis with ivermectin?

…keeping a physical distance from one another, and some have even started wearing face and nose masks. During the ivermectin treatment, keeping a physical distance is the most frequently practiced precautionary measure, along with personal social distance such as the practice of no-contact greetings.

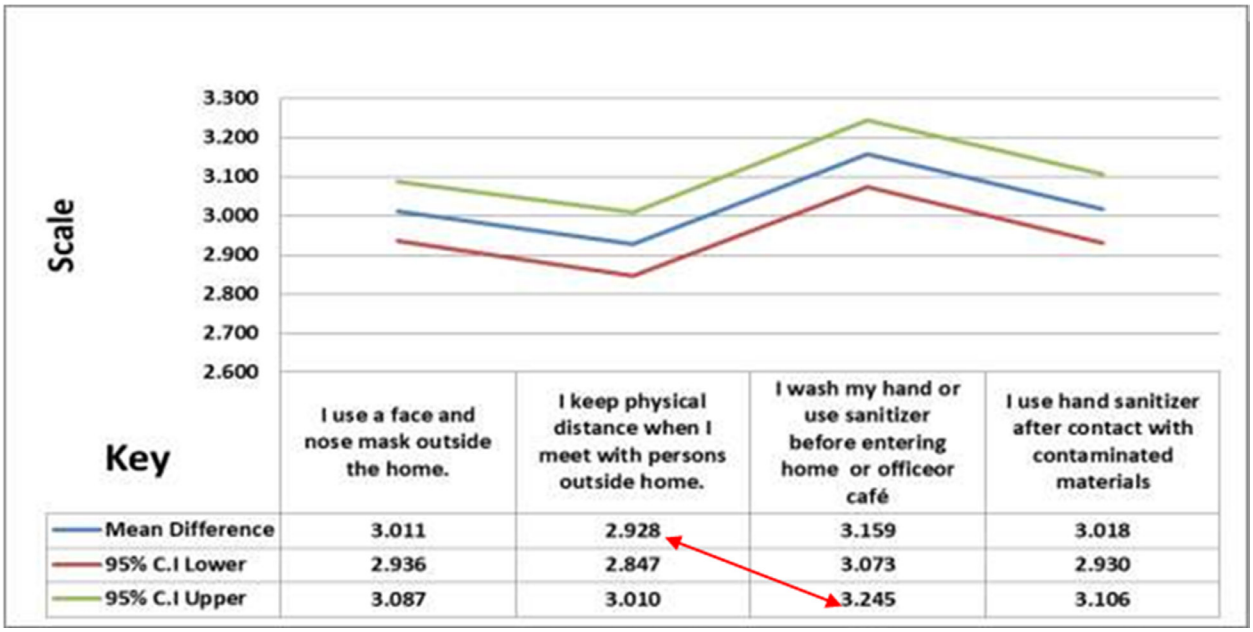
The respondents provided justification for why some precautionary measures are most frequently practiced and others are not; specifically, the majority (64%) stated that the most effective precautionary measure can be practiced by anyone, and the second majority (26.7%) stated that the main reason was that the most widely practiced precautionary did not cost them money to practice. The rest, what is locally available and appropriate precautionary measures, the government provides us free of charge, and the other reasons were 4.5%, 2.7%, and 2.2% respectively (**Figure 5**).



	Government provide us free of charge	Local available and appropriate preventive measure	Most effective and can be practiced by every one.	Most effective and no cost us to practice it	Other	Total
%	2.7	4.5	63.9	26.7	2.2	100.0

Figure 5: Why are some precautionary measures most frequently practiced and others not?

Level of precautionary measure practice: The frequency of practicing the novel Coronavirus SARS-COV2 precautionary measures was assessed using a verbal frequency scale. The majority of the interviewees stated they wash their hands or use hand sanitizer before going into a cafe, office, or home. With a 95% confidence interval with the lower and upper bounds of 3.07-3.24, the mean difference had the highest score, which were 3.159. The three indicative sentences have demonstrated that more than half of the study's participants were employing various preventive measures to varying degrees. With a 95% confidence interval, the mean difference is between 2.938 and 3.159, with the lower and upper bounds of the scale ranging from 2.85 to 3.24. This is in line with the scale level "practice sometimes," and it shows the general level of precautionary measures practiced. Wearing a nose and face mask when departing the house, keeping a safe physical distance when meeting someone, washing hands or using hand sanitizer before going into a home or cafe, or office, and using hand sanitizer when in contact with infected objects are a few examples (**Figure 6**).



Key	I use a face and nose mask outside the home.	I keep physical distance when I meet with persons outside home.	I wash my hand or use sanitizer before entering home or officeor café	I use hand sanitizer after contact with contaminated materials
Mean Difference	3.011	2.928	3.159	3.018
95% C.I Lower	2.936	2.847	3.073	2.930
95% C.I Upper	3.087	3.010	3.245	3.106

Figure 6: Verbal frequency: Level of precautionary measure practice

Acceptance and response: The majority of participants, or 69.3% of participants who agreed, thought that the knowledge acquired so far was sufficient for preventing the novel Coronavirus SARS-CoV2 pandemic. 26.5% of individuals opposed the lockdown, while 44.4% of participants agreed with it. According to the 70.6% of participants who agreed that maintaining physical distance is the essential precautionary measure to prevent the novel Coronavirus SARS-CoV2 pandemic in the study area. 66.6% of study participants agreed, with 25.6% strongly agreeing that washing hands protected them from the novel Coronavirus SARS-CoV2 pandemic and other infectious diseases. The majority, or 75.8% of participants, believed that the novel Coronavirus SARS-CoV2 pandemic is a disease that can be prevented (**Table 1**).

Table 1: Attitudinal measurement: Level of agreement

Indicative Sentence	Level of agreement	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
1. Information provided so far is good enough in protecting you from the novel coronavirus SARS-CoV2 pandemic.	Strongly disagree	6	1.3	1.3	1.3
	Disagree	12	2.7	2.7	4.0
	Neutral	51	11.4	11.4	15.5
	Agree	309	69.3	69.3	84.8
	Strongly agree	68	15.2	15.2	100.0
	Total	446	100.0	100.0	
2. Lockdown to mitigate the pandemic in Ethiopia is the best precautionary measure.	Strongly disagree	23	5.2	5.2	5.2
	Disagree	118	26.5	26.5	31.6
	Neutral	61	13.7	13.7	45.3
	Agree	198	44.4	44.4	89.7
	Strongly agree	46	10.3	10.3	100.0
	Total	446	100.0	100.0	
3. Maintaining Physical distancing is necessary to prevent the novel coronavirus SARS-CoV2 pandemic?	Strongly disagree	3	0.7	0.7	0.7
	Disagree	5	1.1	1.1	1.8
	Neutral	54	12.1	12.1	13.9
	Agree	315	70.6	70.6	84.5
	Strongly agree	69	15.5	15.5	100.0
	Total	446	100.0	100.0	
4. Hand washing is protecting you from the novel coronavirus SARS-CoV2 pandemic and other contagious diseases.	Strongly disagree	8	1.8	1.8	1.8
	Disagree	1	0.2	0.2	2.0
	Neutral	26	5.8	5.8	7.8
	Agree	297	66.6	66.6	74.4
	Strongly agree	114	25.6	25.6	100
	Total	446	100.0	100.0	
5. Novel coronavirus SARS-CoV2 pandemic is a preventable disease.	Strongly disagree	12	2.7	2.7	2.7
	Disagree	4	0.9	0.9	3.6
	Neutral	24	5.4	5.4	9.0
	Agree	338	75.8	75.8	84.8
	Strongly agree	68	15.2	15.2	100.0
	Total	446	100.0	100	

The qualitative results demonstrate that crucial preventive measures are in place to mitigate the pandemic:

…social distancing, which includes travel restrictions, the closing of schools, workplaces, stadiums, or shopping centers, and quarantines were practiced in the first three to four months of the outbreak of the Coronavirus disease (COVID-19), and these precautionary measures were practiced for a limited period.

According to a qualitative finding at the beginning of the pandemic, all resources were geared toward preventing the spread of disease in a number of ways:

…At the start of the Coronavirus disease (COVD-19), education and information were heavily promoted through mass, social, and electronic media. It was also on the agenda of government officials and non-governmental organizations; however, that unreserved effort gradually declined from time to time.

DISCUSSION

The WHO interim guidelines state that using face and nose masks, practicing hand hygiene, and maintaining physical distance are the three basic precautionary measures that must be followed at all times during the planned NTD activities [15]. As a result, in demand to resume NTD activities, countries with endemic NTD must adopt national the novel Coronavirus SARS-CoV2 guidelines or protocols. Countries are dedicated to delivering safe MDA by putting all necessary measures in place

to ensure that neither the general public nor the medical staff providing MDA services is at risk of virus exposure [16]. In a view of this, providing technical and material support for the novel Coronavirus SARS-CoV2 taskforce was engaging in the early stages of the pandemic due to the involvement of community and faith-based organizations, the media, and numerous sector organizations in education and information dissemination. Therefore, this study aims to assess the extent to which the novel Coronavirus SARS-CoV2 pandemic precautionary measures were implemented in harmony with the guidelines at the community level in carefully chosen onchocerciasis-endemic urban areas.

We found that almost all 99.6% of participants were aware of the novel Coronavirus SARS-CoV2 pandemic, and the finding is consistent with the study conducted in the Punjab province of Pakistan 99.25% [20], provinces of the Philippines during the earlier stage of the pandemic 94% [18], Oromia regional state of Ethiopia, 91.6% of the participants had heard about the novel Coronavirus SARS-CoV2 pandemic, even though 63.1% had doubts about its existence [21]. According to the findings of this study, 85%, 50%, and 61.4% of the participants indicated that cough droplets, sneezing, and contact with infected objects were the three main ways that the disease was spread from an infected person to a healthy person. The findings consistent with the study conducted in the Gaza Strip and the West Bank of Palestine (79%), as well as the provinces of the Philippines (89.5%), the majority of respondents identified coughing and sneezing as the methods by which the Coronavirus is transmitted from an already infected person to healthy individuals [17,18]. Reportedly, the majority of respondents to this study (72%) have practiced hand washing in the community to reduce the spread of the Coronavirus, despite other unanticipated circumstances. This result is lower than the results of studies conducted in the province of the Philippines (82%), Dire Dawa residents of Ethiopia (96%), the Oromia region of Ethiopia (84%), and ten zonal towns in the southern region (82%) of Ethiopia [18,21-23]; it is higher than the Gedeo zone (59%) of Ethiopia [24].

Since the resume of the NTDs program, activities have been carried out in harmony with the national novel Coronavirus SARS-CoV2 pandemic protocol, which was adapted from the WHO interim guidelines [15,16]. Onchocerciasis is one of the neglected tropical diseases that require preventive chemotherapy, and its community-directed treatment with ivermectin was implemented in the context of the protocol of the novel Coronavirus SARS-CoV2 pandemic in Ethiopia [25]. This study was conducted in areas where onchocerciasis was treated with ivermectin and novel Coronavirus SARS-CoV2 precautionary measures were implemented to prevent the transmission of the novel Coronavirus. According to the participants in the study report, to slow down the novel Coronavirus SARS-CoV2 pandemic transmission, maintaining physical distance is the most frequently practiced (66%) basic precautionary measure, along with social distancing like non-contact greetings. With a 95% confidence interval, the mean difference is between 2.938 and 3.159, with the lower and upper bounds of the scale ranging from 2.85 to 3.24. This is agreeing with the scale level "practice sometimes," and it shows the general level of precautionary measures practiced. 70.6% of respondents agreed that keeping one's physical distance from others is the most important precautionary measure to stop the spread of the novel Coronavirus SARS-CoV2 in the study area. Furthermore, 25.6% of study participants strongly agreed, and 66.6% agreed that washing their hands helped them avoid contracting diseases like the novel Coronavirus SARS-CoV2 pandemic. 75.8% of study participants, or the majority, believed that the novel Coronavirus SARS-CoV2 pandemic was a disease that could be prevented.

CONCLUSION

The Bonga, Mizan-Aman, and Shebe urban areas were well aware of the novel Coronavirus SARS-CoV2 pandemic. These urban communities acquired extensive health education and information, which had the anticipated impact on how precautionary measures are implemented. In the chosen urban areas, precautionary practices like hand washing are frequently practiced under normal circumstances. These precautionary practices also include keeping a physical distance during onchocerciasis mass drug administration. Even though, some precautionary measures are frequently practiced, how they are applied varies depending on the situations and environments in which they are appropriate and applicable.

DECLARATION

Authorship Right

All investigators have a right to authorship according to their contribution.

Data Availability

The authors confirm that all the data underlying the findings are fully available without restriction. All relevant data is within the paper.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this study.

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