



# Compliance, Barriers, and Facilitators to Social Distancing Measures for Prevention of Coronavirus Disease 2019 in Northwest Ethiopia, 2020



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## ABSTRACT

**Background:** The coronavirus disease 2019 (COVID-19) pandemic is the defining global health crisis of our time. To date, there is no curative treatment for COVID-19, and with vaccines only recently being rolled out predominantly in wealthy countries, prevention still remains the main strategy. Social distancing has been proven to mitigate the epidemic and limit disease spread. As is the case in many other countries, the Ethiopian government has declared a state of emergency and taken several measures to impose social distancing. The level of compliance with social distancing measures in Ethiopia is unknown.

**Objective:** The aim of this study was to assess the compliance, barriers, and facilitators to social distancing measures for the prevention of COVID-19 in Northwest Ethiopia.

**Methods:** A cross-sectional survey using telephone interview triangulated by a qualitative study was conducted over a period of 1 month from April 20 to May 20, 2020, at the University of Gondar Hospital in Gondar, Ethiopia. A total of 401 randomly selected participants, and 12 key representative informants selected by convenience were included for the quantitative and qualitative studies, respectively. Information on sociodemographic factors, knowledge about COVID-19, and practices concerning preventive measures—particularly social distancing—was collected. Respondents were asked what they believed were the barriers and facilitators of social distancing during in-depth face-to-face interviews. Data were entered and analyzed using Epi-data and Stata software, respectively. Frequencies and odds ratios were analyzed. *P* values < 0.05 were considered statistically significant, and a confidence level of 95% strength of association was used.

**Results:** A total of 425 potential participants were approached and 401 responded positively (response rate = 94.4%). Of the 401 study participants, 55.4% (95% CI, 50.4%–60.2%) reported poor compliance with social distancing measures. The mean (SD) age of participants was 36.4 (11.8) years. The majority of participants (63.84%) reported that they went to crowded places without putting on a face mask. Of the participants, 243 (60.6%) and 306 (76.3%) had good knowledge of COVID-19 transmission and prevention, respectively. Multivariate logistic regression analysis revealed that only age (adjusted odds ratio = 1.02; 95% CI, 1.00–1.04) was significantly associated with social distancing measures, with older persons more likely than younger to comply with social distancing guidelines.

**Conclusions:** The majority of the study's participants reported poor compliance with social distancing measures set by the government and health authorities for prevention of COVID-19. Reported compliance with social distancing measures increased with increasing age. (Curr Ther Res Clin Exp. 2021; 82:XXX–XXX) © 2021 Elsevier HS Journals, Inc.

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## Introduction

Coronavirus disease 2019 (COVID-19) was first reported in Wuhan, China, during January 2020. The etiological agent of COVID-19 is severe acute respiratory syndrome coronavirus 2.<sup>1</sup>

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Symptoms usually include fever, cough, sore throat, breathlessness, fatigue, and malaise, amongst others. The disease is mild in most (80%) people. In the other 20% with risk factors, such as those with advanced age and comorbidities, it may progress to pneumonia, acute respiratory distress syndrome, and multiorgan dysfunction. Many people, moreover, are asymptomatic.<sup>2-4</sup> The case-fatality rate differs from country to country, and is approximately 2.2% worldwide and 1.5% in Ethiopia.<sup>5</sup> Diagnosis is made by reverse transcription-polymerase chain reaction based tests from specimens taken from nasopharynx and oropharynx.<sup>4</sup> Treatment is essentially supportive and symptomatic. There are no effective antiviral treatments for COVID-19 found to date, although studies have shown that remdesivir can be helpful in severe cases.<sup>4,6,7</sup> Infection is transmitted through large droplets generated during coughing and sneezing by symptomatic or asymptomatic patients. Infected droplets can spread 1 to 2 m and deposit on surfaces.<sup>8-10</sup>

COVID-19 has rapidly spread all over the world and poses a great threat to global public health.<sup>3,11</sup> Because there is no curative treatment for COVID-19 at this point in time—with vaccines only recently being rolled out predominantly in wealthy countries—prevention remains the main strategy in tackling this global threat.<sup>2</sup> Among the preventive strategies, social distancing is among the most effective methods and is currently being implemented in many countries whilst awaiting the arrival of vaccines.

The term *social distancing* or *physical distancing*, as it is sometimes called, refers to efforts that aim, through a variety of means, to decrease or interrupt the transmission of COVID-19 in a population subgroup by minimizing physical contact between potentially infected and healthy individuals, or between population groups with high rates of transmission and those with no or low levels of transmission.<sup>12,13</sup> Measures to effect such distancing include staying at home and leaving the home for essential requirements only, maintaining a 2-m distance between oneself and others, avoiding physical greetings (hugs, kisses, and handshakes), closures of workplaces/schools, cancellations of mass gatherings, and quarantined and locked-down measures in affected areas.<sup>12,14-16</sup> Making purchases with the use of tap and go for credit or debit cards has become increasingly common, and traveling and shopping at quiet times are also recommended.<sup>14-16</sup>

Social distancing has had a substantial influence in limiting the spread of COVID-19 in China.<sup>10</sup> Clearly, quarantine, social distancing, and isolation of infected populations can help to contain the epidemic.<sup>17</sup> For example, early implementation of social distancing measures helped to rapidly control an outbreak in South Korea.<sup>18</sup> A modeling study has predicted that if social distancing measures had been implemented 1 week, 2 weeks, or 3 weeks earlier in China, cases would have been reduced by 66%, 86%, and 95%, respectively.<sup>19</sup>

Ethiopia reported the first case of confirmed COVID-19 on March 13, 2020. Since then, cases continue to increase exponentially. In response to this, the Ethiopian government declared a 5-month-period state of emergency on April 8, 2020, to counter and control the spread of COVID-19 and mitigate its impact. Social distancing measures were declared, including the banning of public gatherings and greetings by handshakes, closure of schools and children's playgrounds, and prohibition of group sporting activities.

Although several developed nations around the world are currently implementing social distancing measures, implementing these guidelines and regulations might be difficult in a context such as Ethiopia, owing to the different customs, cultural values, education, and socioeconomic status of its citizens, not to mention the impracticality of work-at-home alternatives compared with the rest of the world.

Understanding the level of the practice and practicability of social distancing and its associated factors using reliable methods is highly important in designing intervention strategies and policies

that can be effective in combating the epidemic. This study aimed to assess the level of practice of social distancing, its associated factors, and the barriers and facilitators in implementing the practice in Gondar, Northwest Ethiopia.

## Methods

### Study design

A cross-sectional study was conducted using a telephone interview. It employed a mixed approach of both quantitative and qualitative techniques. The quantitative study assessing the level of practice of social distancing measures and its associated factors was triangulated with a qualitative approach that explored both the barriers and facilitators of practicing social distancing.

### Study setting and period

The study was conducted over the course of 4 weeks (April 20–May 20, 2020) in Gondar (North, Central, and West zones), Northwest Ethiopia. Ethiopia, a sub-Saharan country of nearly 110,000,000, is the second largest country in Africa and the home to many of the continent's premier institutions.

Although the country is rapidly developing, it is still among the poorest countries in the world, with an average gross domestic product of approximately \$970 per capita. The capital, Addis Ababa, serves as the headquarters of many important institutions such as the African Union, the United Nations Economic Commission for Africa, and many of the global nongovernmental organizations found throughout the continent. Gondar city, the capital of the Central Gondar Zone, is located 750 km north of the capital city in the Amhara Regional state. As is the case in most parts of the country, agriculture is the mainstay economy of the people in the study area, and the economy could best be described as a subsistence peasant economy. According to a 2017 report from the Groupe Speciale Mobile Association, there were 34.7 million mobile subscribers in Ethiopia, with mobile penetration at 34%.<sup>20</sup> Gondar University's comprehensive specialized hospital is a tertiary-level hospital in Gondar, serving as the only referral hospital for the more than 5 million people in the catchment area.

### Population, sample size, and sampling procedure

The study population included a random sample of all mobile telephone subscribers within the Gondar branch of Ethio Telecom, a government-owned telecommunications company and the sole supplier of such services in the country. For convenience of accessing the list of mobile telephone numbers, we restricted our sample to those residing in Central, North, and West Gondar zones during the study period. Individuals who own mobile telephones and a subscription from Gondar's Ethio Telecom branch who were currently living outside of the study area during the study period were excluded.

In determining the sample size for the quantitative component, because we could not reference any relevant studies examining COVID-19 in the country at the time of study's initiation, we assumed a proportion of 50% to get the maximum sample size for the first objective. Assuming a 5% confidence level, the sample size was 385; assuming a 10% nonresponse rate, furthermore, the total sample size was 425. We could not get input to determine the sample size for the second objective, and therefore assumed that the same sample size would be sufficient to answer the research question. With respect to qualitative study data, the actual sample size was determined by how many responses had been obtained when saturation was reached, defined as when the authors

subjectively determined that responses contained only redundant ideas and no new opinions were emerging.

For the quantitative study, participants were randomly selected using their subscription telephone number from Gondar's Ethio Telecom. Ethiopia uses a 12-digit format, and of these digits, the first 6 subscribed by Ethio Telecom are the same. Therefore, sampling was performed by varying the last 6 digits using a simple random sampling technique on computer-generated random numbers. For the qualitative method, individuals we assumed to be the most informed about the communities and had active social involvement, such as religious leaders, community leaders, health extension workers, taxi drivers, and law-enforcement practitioners, were selected, and an in-depth face-to-face interview was conducted, focusing on the barriers and facilitators of social distancing.

#### Variables and operational definition

The outcome variable of interest included reported compliance with social distancing. The independent variables were sociodemographic characteristics (eg, age, sex, marital status, and occupation), perceptions about social distancing, and knowledge about the prevention and transmission of COVID-19. Reported compliance with social distancing was considered "good" if an individual either stayed at home or if one had to go out, and if the individual made good faith efforts to attend noncrowded areas. "Poor" reported compliance was defined as leaving one's house without wearing a mask and going to crowded places.

Perception regarding social distancing was the composite of 5 items (ie, worshipping from home, calling instead of a condolence visit, following lockdown, staying at home, and not going to the market). Perception toward social distancing was considered "good" when the person exhibited 3 or more of the 5 behaviors. Knowledge about transmission of COVID-19 was measured with 5 items (ie, close contact with an infected person, handshaking, exposure to aerosol droplets, contact with contaminated surfaces, and touching the face with unclean hands). A respondent was considered as having "good knowledge" if he or she scored 3 and above. Similarly, prevention strategies revealing COVID-19 were assessed with 6 items (ie, hand hygiene, keeping 2-m distance, avoiding touching the face, staying at home, avoiding public gatherings, and wearing a face mask). A respondent was grouped as "knowledgeable" if he or she scored 3 and above.

#### Data collection tools and procedures

Direct telephone calls were made to randomly selected telephone numbers during working hours. Data collectors were trained health care professionals. Three attempts of calls per telephone number were made before giving up. An appointment for a repeat call was arranged if timing was not convenient for the participants. After offering courteous greetings, a brief introduction relating to the purpose of the telephone survey was given to the participant, followed by questioning whether he or she had been residing in the study area for at least 6 months preceding the date of interview. Those who responded positively were asked for verbal consent to participate in the study. Data were then collected by reading a structured questionnaire to the participant. This particular questionnaire was developed for this study (see the Supplemental Appendix in the online version at doi:10.1016/j.curtheres.2021.100632). Information on sociodemographic characteristics, knowledge about COVID-19, and practice of preventive measures, particularly social distancing, were queried and responses were recorded on the questionnaire.

To ensure the quality of data collection, supervisors redialed 5% of the randomly selected respondents and rechecked the filled questionnaire. For the qualitative interview, data were collected

**Table 1**  
Sociodemographic characteristics of participants' compliance with social distancing measures and associated factors to prevent coronavirus disease 2019 (COVID-19) in Northwest Ethiopia, 2020 (n = 401)

Characteristic	Frequency	Percent
Sex		
Male	285	71.07
Female	116	28.93
Residence		
Urban	352	87.78
Rural	49	12.22
Educational status		
Illiterate	33	8.23
Elementary	89	22.19
Secondary	80	19.95
Preparatory	38	9.48
Diploma and above	161	40.15
Field of study (n = 161)		
Health related	16	9.94
Other than health	145	90.06
Occupation		
Government	104	25.94
Private	70	17.46
Merchant	81	20.20
Farmer	46	11.47
Others*	100	24.94
Elders older than age 50 y in a family		
Yes	153	38.15
No	248	61.85

\* Others includes housewife, daily laborer, religious leader, and operator.

with face-to-face, in-depth interviews, taking all hygienic precautions and maintaining social distancing. Subsequent communications were audio-recorded as a source document for this study. To capture the qualitative data, a semistructured questionnaire was used.

#### Statistical analysis

Data were entered into Epi-data version 3.1 (The EpiData Association Odense, Denmark) and were exported to Stata version 14 (StataCorp, College Station, Tex) for statistical analysis. Following this, data cleaning was performed before conducting descriptive analysis with tables, graphs, and charts. To examine the association between independent variables and the level of social distancing, a binary logistic regression was performed. To screen independent variables for multiple logistic regressions, we used a *P* value of 0.2 as a cutoff point. *P* values < 0.05 and a confidence level of 95% by 2-sided test were considered to indicate statistical significance.

For the qualitative study, which took place in the subscriber's native tongue of Amharic, the in-depth recorded interviews were transcribed and translated into English. Thematic content analysis was conducted to identify the barriers and facilitators of social distancing among residents. Finally, thorough analyses were conducted on the associated factors, barriers, and facilitators of social distancing.

## Results

#### Sociodemographic characteristics

A total of 425 study participants were approached and 401 responded positively (response rate = 94.4%). The mean (SD) age of the participants was 36.4 (11.8) years. The majority (n = 285 [71.1%]) were men and 352 (87.8%) reported urban residency. One hundred sixty-one (40.2%) participants had a diploma and beyond, of whom only 9.9% studied health-related fields (Table 1).

**Table 2**

Source of information and knowledge about transmission and prevention of coronavirus disease 2019 (COVID-19) in Northwest Ethiopia, 2020 (n = 401)

Variable	Frequency	Percent
Heard before about COVID-19		
No	15	3.74
Yes	386	96.26
Heard from radio		
No	253	63.09
Yes	148	36.91
From television		
No	64	15.96
Yes	337	84.04
From school		
No	396	98.75
Yes	5	1.25
From a religious center		
No	387	96.51
Yes	14	3.49
Others*		
No	187	46.63
Yes	214	53.37
Is COVID-19 ever reported in Ethiopia		
Yes	360	89.78
No	41	10.22
Knowledge about COVID-19 transmission		
Poor	158	39.40
Good	243	60.60
Knowledge about COVID-19 prevention		
Poor	95	23.69
Good	306	76.31
Perception of social distancing		
Poor	139	34.66
Good	262	65.34

\* Other sources include family, friend, Facebook, telegram, YouTube, poster, Ethio Telecom, health workers, other people, health office, *kebele* leader, health extension workers, or mobile call.

#### Source of information, knowledge, and perception about transmission and prevention of COVID-19

Of the total participants, 386 (96.3%) claimed to be informed or had knowledge of COVID-19 before the time of data collection period and their main source of information was television. At the time of data collection, about 10% of the participants believed incorrectly that COVID-19 had not yet been reported in Ethiopia. Of all participants, 243 (60.6%) and 306 (76.31%) had good knowledge about COVID-19 transmission and prevention, respectively (Table 2 and Table 3).

#### Compliance with social distancing measures and activities related to social distancing

Out of 401 participants included in the quantitative study, 55.4% (95% CI, 50.4%–60.2%) reported poor compliance with social distancing measures. Among the total participants, almost 89% reported leaving their house, 38% of whom considered their leaving was for an absolutely essential reason. Participants admitted going to different crowded places without a face mask, including churches (58.48%), open market places (58.04%), funerals (25.89%), mosques (1.79%), and weddings (1.79%). Only 59.22% claimed to keep 2-m distances between themselves and others, although almost all (93%) study participants reported the practice of regular handwashing (Table 4).

#### Factors associated with noncompliance with social distancing measures for prevention of COVID-19

On multivariate analysis, only age was found to have a statistically significant association with the reported compliance of social

distancing measures, with older persons more likely than younger individuals to comply with social distancing guidelines (Table 5).

#### Summary of the qualitative findings

A total of 12 participants were selected purposefully from religious leaders, community health workers, traffic police, drivers, and community leaders who were invited for qualitative face-to-face interviews. Three main themes were identified from the content analysis of qualitative research. These were the existing facilitators or opportunities for social distancing, barriers or challenges of social distancing in the community, and recommendations to adapt social distancing in the context of Ethiopia. Direct quotes from transcripts were provided to illustrate these themes (Table 6).

#### Existing opportunities for practicing social distancing

There have been many opportunities to practice social distancing at the community level. Most participants agreed on the following points: because the epidemic started elsewhere it has provided researchers and community members a chance to learn from others. For religious communities, norms and rules have adapted in light of social distancing principles, and top religious leaders have supported health professionals and followed government recommendations from the outset. A 50-year-old priest explained some of the opportunities that can support COVID-19 protection practices by saying,

Even though the disease has no medicine and all the believers believe that we can be cured and protected by only God, the norms and rules of the church are in line with social distancing principles (for example, individuals should stand far apart from each other so that one cannot disturb the other while praying). Social events such as weddings and christening are not against the rules to prevent COVID-19 by themselves. Additionally, the top authority of the church (*sinodos*) informed fellow Christians on media (television and official letters) that followers can pray from home until the pandemic is controlled.

Similarly, community health workers and traffic police agreed that there are conditions that can facilitate social distancing practice. They mentioned the presence of well-organized volunteer workers at the community level to enact social distancing measures, the trustworthiness of community health workers, and top Christian and Muslim religious leaders have a good understanding and awareness concerning prevention of the disease. The decision made by the government to decrease passenger numbers by 50% in public transport and penalty measures for drivers violating this recommendation were explained by participants.

A 27-year-old female community health worker with 2 years of working experience described how top religious leaders work alongside and cooperate with them.

...at 1 of the Ethiopian Orthodox churches, many people were attending together in holy water. We informed them to avoid gatherings by explaining the effects and transmission of COVID-19. But they assumed we were interfering with their beliefs. Later the religious leaders and local authorities were informed and the holy water service was temporarily closed.

Another female community health worker, aged 27 years, also explained the influence of COVID-19 on volunteer workers and their acceptance by the community to improve the application of social distancing. She stated:

...because we are always working with them, they usually accept what we recommend to implement COVID-19 protection measures. In addition to the existing volunteer workers in the

**Table 3**  
Knowledge about coronavirus disease 2019 (COVID-19) transmission and prevention methods and perception regarding social distancing measures to prevent COVID-19 in Northwest Ethiopia, 2020 (n = 401)

Variable	Frequency	Percent
1. Common means of transmission of COVID-19		
1.1 Close contact with an infected person		
Yes	212	52.87
No	189	47.13
1.2 Handshaking		
Yes	368	91.77
No	33	8.23
1.3 Exposure to droplets (sneezing, coughing)		
Yes	285	71.07
No	116	28.93
1.4 Touching contaminated objects/surfaces		
Yes	157	39.15
No	244	60.85
1.5 Touching eyes, mouth, and nose with unclean hands		
Yes	80	19.95
No	321	80.05
2. Main prevention methods for COVID-19		
2.1 Regular hand hygiene		
Yes	365	87.78
No	49	12.22
2.2 keeping 2-m distance		
Yes	336	83.79
No	65	16.21
2.3 Avoid touching face with unclean hands		
Yes	78	19.45
No	323	80.55
2.4 Stay at home		
Yes	123	30.67
No	278	69.33
2.5 Avoid public gatherings		
Yes	219	54.61
No	182	45.39
2.6 Putting face mask		
Yes	146	36.41
No	255	63.59
3. Perception toward social distancing measures		
3.1 Worshipping from home instead going to church/mosque		
Yes	257	64.09
No	144	35.91
3.2 Calling people on telephone rather than attending funerals, weddings, and so on		
Yes	293	73.07
No	108	26.03
3.3 Not going to the market		
Yes	204	50.87
No	197	49.13
3.4 Staying at home strictly		
Yes	299	74.56
No	102	25.44
3.5 Total restriction of people's movement (lockdown)		
Yes	145	36.16
No	256	63.84

community, we organized volunteer groups with 10 members per village, and then selected 1 representative from each group. We easily communicate with the representative to transfer new information or we can take the information from those leaders on the challenges they face.

#### *Perceived barriers or challenges of social distancing in the community*

Participants clearly described that although there are some opportunities to implement social distancing measures, there are many challenges that prohibit them from applying such measures. The most commonly agreed upon points offered were: the inconsistent decisions by the government, considering the media as the treachery of religion, and assuming COVID-19 is brought upon us by the devil and can only be cured by God. Additional barriers raised by some participants include social customs such as attending funerals in large groups, consoling families of the deceased by hugging, giving a pat on the shoulder, and holding hands. Absence

of penalty measures on those not abiding by social distancing measures set by the government was also mentioned as challenging to health workers.

A community health worker with 2 years of working experience explained how many people in the community did not accept orders not to attend church mass and religious gatherings. She noted,

During a home-to-home visit for observation and awareness creation on COVID-19, the villagers welcomed us and accepted our health education. Because they know about us and the religion we follow and that we are 1 of them. While others give health education through media, they are suspicious and some even may consider them as an evil spirit. They say, no one can prohibit us from going to our church. That is why the people of the community are always attending mass services at the churches crowded together. After the pandemic was reported in the country, everybody was strict to stay at home or maintain a 2-m distance, and there were handwashing facilities at crowded

**Table 4**  
Activities related to social distancing measures to prevent spread of coronavirus disease 2019 in Northwest Ethiopia, 2020.

Variable	Frequency	Percent
Get out of home		
No	43	10.72
Yes	358	89.28
Essential reason (grocery, medical care) (n = 358)		
No	222	62.01
Yes	136	37.99
Go to crowded place without facemask (n = 358)		
No	134	36.16
Yes	224	63.84
Church (n = 224)		
No	93	41.42
Yes	131	58.48
Mosque (n = 224)		
No	220	98.21
Yes	4	1.79
Open market (n = 224)		
No	94	41.96
Yes	130	58.04
Funerals (n = 224)		
No	166	74.11
Yes	58	25.89
Weddings		
No	220	98.21
Yes	4	1.79
Type of transport (n = 358)		
On foot		
No	48	13.41
Yes	310	86.59
Public transport		
No	300	83.80
Yes	58	16.20
Private/bajaj*		
No	258	72.07
Yes	100	27.93
Physical contact during greeting		
No	314	78.30
Yes	87	21.70
Regular handwashing		
No	29	7.23
Maintain 2 m distance		
No	146	40.78
Yes	212	59.22

\* Bajaj is a 3-wheeled motorized taxi.

places. Gradually these good practices have become less consistent.

The participant raised further challenges to following social distancing measures for COVID-19 prevention: inconsistent measures by law enforcement bodies, such as tight control at houses of worship while ignoring other crowded places like open markets. Few religious leaders teach against social distancing measures and there are inconsistencies in the implementation of social distancing measures among different religious institutions. Furthermore, the absence of a strong monitoring system in crowded places like houses of worship, markets, transport stations, funerals, and weddings, also contributed to inconsistencies for implementing social distancing measures. The following excerpt from a 50-year-old man from the community described the observed challenges that exist at the community level, among religious leaders, and at a government levels as follows:

The Christian followers' belief that Gondar is the country of 44 covenants and that the virus cannot attack the people of the community. When I put a face mask and gloves [on], there were people who teased and made fun of me, calling me "Corona." I observed that in mourning people were out walking without keeping their distance. People are not giving much attention to the disease, they are walking in groups and not pro-

tecting themselves. On top of this, the government is not acting uniformly in enforcing the law (there is more strict control in houses of worships while it is lenient in other places such as markets and public transportation). Few religious leaders teach against the rule to prevent COVID-19, affirming that they should continue their cultural and religious practice and only rely on faith in God, and leave everything else being told aside.

A 50-year-old priest added:

There are extra or unnecessary practices beyond the church recommendations such as dancing during christenings and hugging or holding hands while mourning a deceased loved one that can increase the disease transmission. These are unnecessary extra practices that are not part of the religious ceremony in the church, and thus need to be avoided in the era of COVID-19.

#### Suggestions to adopt social distancing in the Ethiopian context

Although there are many challenges in practicing social distancing measures to prevent the spread of COVID-19, there have been many solutions raised by key informants. The following suggestions have been shown to help: continuous health education and increasing awareness in communities apropos prevention, explaining that social distancing principles are in harmony with and not in opposition to religious rules, consistent law enforcement by the government, involvement of respected religious leaders working together at the ground level, and limiting the number individuals who attend funerals.

A 50-year-old man from the community described a number of solutions that ought to be considered to better implement social distancing measures.

He stated,

Religious preachers are more influential than any external body. The decision of our top religious authority (*sinodos*) is not being implemented. They don't follow what is going on. It is good to work on preachers. Therefore, the religious media could work to teach their followers using influential preachers and religious leaders. So that people can stay at home, avoid going out to crowded areas, and greetings without physical contact. People change their behavior gradually through continuous education. Total closure of the church and prohibiting followers from going church is not a good solution.

A 40-year-old man from the religious community suggested additional solutions as follows:

...Without complete restriction of religious followers from the church, limit the number of attendants on mass prayers like *kidassie*. Similar measures must be taken to other crowded places like markets to be consistent with all social distancing practice. However, avoiding social life is impossible. It is very difficult to deal with grief alone, but limiting the number of individuals attending funeral is a good option. At the same time, during moments of happiness, it is better to avoid dancing and celebrating together. By keeping our physical distance, we can emotionally get connected in our happiness and sadness.

#### Discussion

This is among the first studies from Ethiopia that assessed reported compliance with social distancing measures for the prevention of COVID-19. A total of 401 participants were included in the quantitative survey, more than half (55.4%) of whom reported poor compliance with social distancing guidelines. Almost 9 out of 10 participants left their home during the 3 days before the interview,

**Table 5**  
Factors associated with compliance with social distancing measures to prevent COVID-19 in Northwest Ethiopia, 2020

Variables	Compliance		COR (95% CI)	AOR (95% CI)
	Good	Poor		
<b>Age</b>			1.01(0.99,1.03)	<b>1.02 (1.00,1.04)*</b>
<b>Sex</b>				
Male	119 (41.75)	166(58.25)	1	1
Female	60 (51.72)	56(48.28)	0.67(0.43,1.03)	0.70 (0.44,1.13)
<b>Educational status</b>				
Illiterate	17(51.52)	16(48.48)	1	1
Elementary	42(47.19)	47(52.81)	1.19 (0.53,2.64)	1.35 (0.57,3.19)
Secondary	38(47.50)	42(52.50)	1.17 (0.52,2.64)	1.39 (0.54,3.53)
Preparatory	20(52.63)	18(47.37)	0.95(0.38,2.43)	0.94 (0.34,2.62)
Diploma and above	62(38.51)	99(61.49)	1.69(0.79,3.60)	2.08(0.81,5.39)
<b>Occupation</b>				
Government	43 (41.35)	61(58.65)	1	1
Private	28 (40.00)	42(60.00)	1.06 (0.57,1.96)	1.35 (0.69,2.64)
Merchant	38(46.91)	43(53.09)	0.79 (0.44,1.43)	0.99 (0.48,2.08)
Farmer	24(52.17)	22(47.83)	0.64 (0.32,1.29)	0.79 (0.33,1.91)
Others*	46(46.00)	54(54.00)	0.83(0.47,1.44)	1.29 (0.65,2.59)
<b>Elders &gt; age 50in a family dwelling</b>				
Yes	62 (40.52)	91(59.48)		1
No	117 (47.18)	131 (52.82)	0.76 (0.51,1.15)	0.76 (0.49,1.17)
<b>Knowledge of COVID-19 transmission</b>				
Poor	74 (46.84)	84 (53.16)	1	1
Good	105 (43.21)	138 (56.79)	1.16 (0.77,1.73)	1.19 (0.77,1.84)
<b>Knowledge of COVID-19 prevention</b>				
Poor	44(46.32)	51(53.68)	1	1
Good	135(44.12)	171(55.88)	1.09 (0.69,1.73)	0.97(0.59,1.59)
<b>Perception on social distancing</b>				
Poor	57 (41.01)	82 (58.99)	1	1
Good	122 (46.56)	140 (53.44)	0.79 (0.52,1.21)	0.71(0.45,1.12)

\* Statistically significant at p value of less than 0.05.

**Table 6**  
Characteristics of key informant interview participants from Gondar town 2020, Gondar, Ethiopia (n=12)

Participant code	Sex	Age in year	Occupation
P1	Female	27	Community health workers
P2	Female	27	Community health workers
P3	male	31	Traffic police
P4	male	36	Traffic police
P5	male	28	Bajaj driver
P6	male	50	Religious leader(priest)
P7	male	40	Religious preacher(Christian)
P	male	50	Community leader
P10	male	50	People from the community
P11	male	56	Muslim religious follower
P12	male	45	Muslim religious follower

among whom only one-third believed it was for an absolutely essential reason, such as grocery shopping, medical care, or work.

Social distancing helps reduce the infection's spread and the heavy burden COVID-19 places on health care systems. However, the amount of social distancing needed to curb the pandemic remains unclear. For example, a study in the United States via a mathematical model demonstrated that a 1-time intervention would be insufficient to maintain COVID-19 prevalence within the critical care capacity.<sup>21</sup>

Countries such as China and South Korea have implemented strict social distancing measures and have controlled the spread of COVID-19.<sup>10,16,18</sup> In Ethiopia, despite the increasing number of COVID-19 cases and mortality from the disease, the majority of citizens (55.4%) still reported poor compliance with social distancing guidelines. This observation is similar to conclusions from other studies conducted in various parts of Ethiopia. A study from North Shoa, Ethiopia, revealed that the overall adherence level of the community toward the recommended safety measures of COVID-19 was 44.1%.<sup>22</sup> Another study from southern Ethiopia showed the overall compliance level with COVID-19 prevention and control

measures at food and drink establishments was 55.5%.<sup>23</sup> A study from the United States found that 87.5% were familiar with social distancing guidelines, 62.5% intended to follow them, and 46.2% claimed to currently followed all guidelines.<sup>24</sup> Our study also found that 60% and 76% of participants had a decent amount of knowledge about the means of transmission and prevention for COVID-19, respectively. This difference in noncompliance and knowledge about the disease could be due to the difference in the population's socioeconomic characteristics. There is evidence that people in low-income settings are not willing, or perhaps not able to make the economic sacrifices that come with social distancing, because the immediate risk of financial losses and hunger are understandably valued over the risk of COVID-19.<sup>25</sup> For instance, a study from Malawi revealed that individuals are more likely to say that they will comply with precautionary measures when the costs are low and the expected benefits are high.<sup>26</sup> A modeling study including 178 countries revealed that social distancing mandates a trade-off between disease risk and economic activity. Poorer people are less able to make those economic sacrifices.<sup>27</sup>

In the qualitative data of our study, we found that engagement from respected religious and community leaders was mentioned by respondents as a strong factor in accepting and practicing social distancing. This is also in line with a recent study from Malawi that revealed that participants appear to comply with traditional authorities and hospital heads' advice.<sup>26</sup> In addition to the economic impact, social distancing in the African context could be disruptive and difficult, and negatively influence social and cultural activities. However, careful community engagement can mitigate these effects.<sup>28</sup> In our qualitative findings, participants witnessed that volunteer community workers were involved in advocating social distancing guidelines in the community and recommend expansion of such good practices.

In the current study, only age as a continuous variable was associated with social distancing. In other studies, the variables male sex and income were also associated with compliance with social distancing guidelines.<sup>24</sup> All other respondent characteristics,

including education, gender, religion, perception, and knowledge, were not significant predictors of social distancing in our study.

Despite the banning of social gatherings by the government, 63.8% of participants in this study reported that they have been to crowded places. This result was highly supported by our qualitative conclusions in the majority of people living in the community support going to places of worship, religious gatherings, and attending mass services.

Common crowded places identified in the study include houses of worship (such as churches and mosques), open markets, funerals, and wedding ceremonies. These strong social ties and attachments with frequent physical interactions have been developed for centuries but suddenly put forward now as risk factors for transmitting COVID-19. Close to 60% of participants had been to a house of worship within the past week before the interview. Religion plays a significant role in Ethiopia. Religious practices and rituals in the country include praying together in mass gatherings and religious holidays.<sup>22</sup> One theory that may explain a lack of compliance for social distancing measures is a clash in values; that is, scientific evidence versus traditional cultures.

Because the disease is primarily transmitted by respiratory droplets, it requires a certain proximity of people for transmission. Of participants who went out of their home, 40.8% said they were not able to regularly keep a distance of 2 m from others. Institutions that provide public services in Ethiopia are inadequate, such that crowding is common in hotels, cafes, restaurants, public transportation, marketplaces, hospitals, and other social institutions. Therefore, many people may find it difficult to maintain a 2-m distance from others.<sup>29</sup> This is consistent with a study from Cape Town that demonstrated that social distancing measures are challenging in informal settlements due to their population density.<sup>30</sup> This is also a significant challenge in most cities in Ethiopia, owing to the presence of many crowded informal settlements and slum housing.

Handshaking, hugs, and kisses are practices that are not recommended to maintain social distancing.<sup>14–16</sup> Ethiopians are known for their warm greetings, including handshakes and kisses on the cheeks, which are currently advised against with regard to COVID-19.<sup>31</sup> Although we note increased compliance in this domain, 21.7% of participants claimed that they greet someone using some form of physical contact.

At the time of this survey, more than 95% of participants had heard about COVID-19 with television being the main source of information. Surprisingly, only a very small minority of 3.7% reported that they had never heard of the disease. In our view, more health education needs to be disseminated.

#### Limitations of the study

The majority of the participants in this study are urban dwellers. This might be due to better access to mobile telephones compared with rural counterparts. Therefore, this study might underrepresent the rural community. According to a Groupe Speciale Mobile Association 2017 report, the mobile penetration of Ethiopia was 34%; this finding might not be representative of individuals without mobile subscriptions.<sup>20</sup> Because this was a mobile survey, participant responses were taken at face value and understood to be their actual COVID-19-related practices. However, there could be gaps between self-reported and actual behavior. Because the study was restricted to Gondar city and its surroundings, the findings might not be generalizable to the rest of Ethiopia.

#### Conclusions

The majority of study participants reported poor compliance with social distancing measures set by the government and health

authorities. Risky practices among study participants included going to crowded places without using a face mask, leaving their house for nonessential purposes, not keeping 2-m distance between oneself and others, and engaging in physical greetings. This study was conducted during the early days of the pandemic and a repeat survey is recommended to investigate any changes on the practice of social distancing.

#### Declaration of Competing Interest

The authors have indicated that they have no conflicts of interest regarding the content of this article.

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