


# BMJ Open Knowledge and perceptions of COVID-19, prevalence of pre-existing conditions and access to essential resources in Somali IDP camps: a cross-sectional study

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## ABSTRACT

**Objectives** This study examined knowledge and perceptions of COVID-19, prevalence of pre-existing conditions and access to essential resources among residents of internally displaced person (IDP) camps in Somalia, where overcrowded settlements with weakened infrastructure, inadequate water, sanitation, and hygiene facilities, and limited access to health services make this vulnerable population particularly susceptible to a COVID-19 outbreak.

**Design** A descriptive, cross-sectional survey.

**Setting** Twelve IDP camps across six areas of the Lower Shabelle region in Somalia.

**Participants** 401 adult Somali IDP camp residents.

**Results** The majority of participants were female (86%) and had received no formal education (89%). While 58% reported being in 'good' health, half of the participants reported having one or more pre-existing conditions. Though 77% of respondents reported taking at least one COVID-19 preventative public health measure, respondents reported a lack of access to adequate sanitation, an inability to practice social distancing and nearly universal inability to receive a COVID-19 screening exam. Questions assessing knowledge surrounding COVID-19 prevention and treatment yielded answers of 'I don't know' for roughly 50% of responses. The majority of participants were not familiar with basic information about the virus or confident that they could receive medical services if infected. 185 (47%) respondents indicated that camp living conditions needed to change to prevent the spread of COVID-19.

**Conclusion** This study highlights low levels of COVID-19 knowledge and limited access to essential prevention and treatment resources among individuals living in Somali IDP camps. A massive influx of additional resources is required to adequately address COVID-19 in Somalia, starting with codesigning interventions to educate those individuals most vulnerable to infection.

## INTRODUCTION

According to the United Nations High Commissioner for Refugees, there are more than 41 million internally displaced persons

## Strengths and limitations of this study

- To the best of our knowledge, this study is one of the first to explore knowledge and perceptions of COVID-19, access to essential services and COVID-19 symptoms and risk factors among individuals living in internally displaced person (IDP) camps in any African country, including Somalia.
- This study drew on a diverse and expansive set of measures and involved a relatively large sample of IDPs that are often understudied and neglected in public health research, especially during the COVID-19 pandemic.
- Respondent health profiles collected in this study rely on self-reported data, which may introduce bias.
- Participants were recruited from 12 Somali IDP camps across six areas of the Lower Shabelle region and were predominantly women, which may limit the generalisability of the study findings.

(IDPs) and 25 million refugees globally.<sup>1</sup> Many of those displaced live in camp settings with conditions that undermine public health guidelines for the control of infectious diseases, making them especially vulnerable to an outbreak of COVID-19.<sup>2</sup> Additional legal, financial and linguistic barriers often inhibit displaced residents from accessing their host country's healthcare system, exacerbating conditions precipitated by an absence of basic amenities, such as soap, running water and medical supplies.<sup>2</sup> Eighty-four per cent of displaced people reside in low- and middle-income countries, which are often ill equipped to institute health management protocols and mobilize response teams within IDP communities.<sup>3</sup> Providing continuity of care for chronic conditions as well as infection prevention measures are necessary to

ensure the well-being of both displaced and host communities.<sup>2,4</sup>

The Ministry of Health in Somalia announced the first confirmed case of COVID-19 in Somalia on 16 March 2020.<sup>5</sup> As of 6 April, 2021, the Ministry of Health of Somalia reported 11,908 confirmed COVID-19 cases, 568 of which have resulted in death.<sup>5</sup> It is well established that Somalia's health system is extremely underprepared for a further outbreak of COVID-19.<sup>6</sup> In Somalia, 30 years of civil war and natural disasters have resulted in nearly 3 million IDPs who now inhabit over 2,100 overcrowded settlements.<sup>7</sup> The prolonged conflict has severely damaged Somalia's health infrastructure, leaving its inhabitants vulnerable to climate-related disasters, malnourishment, infectious disease outbreaks and other humanitarian crises.<sup>8,9</sup>

Somalis face several barriers in accessing their country's healthcare system. Several reports inculcate that healthcare worker shortages and a non-existent health information system leave its residents without reliable access to care.<sup>8,9</sup> Somali physicians have indicated that there are no ventilators and only two intensive care units with a total of 31 beds across the country, which is alarming given that these resources are regarded as necessary to treat severe COVID-19 infections.<sup>10</sup> In addition, two in three Somalis have difficulties accessing safe water, and approximately 50% of health centres do not have reliable access to electricity.<sup>11,12</sup> Qualitative reports signal that care-seeking behaviour is also very poor among Somalis as a result of distrust towards the system's lack of regulation and unaffordable prices.<sup>13</sup> Consequently, Somalia has some of the lowest health indicators in the world with life expectancies of 54 years for males and 57 years for females.<sup>11,14</sup> Studies in Somalia have reinforced a predisposition of IDPs to infectious and water-borne diseases.<sup>15</sup> IDPs are among the most vulnerable to infectious disease outbreaks as they face circumstances such as overcrowding, uncontained sewage and waste, limited access to health services, contaminated water, low immunisation coverage and stigmatisation.

According to the Global Health Security Index, Somalia ranks 194th out of 195 countries in preparedness for a globally catastrophic biological event.<sup>16</sup> To address the dire threat COVID-19 poses to IDPs in Somalia, ongoing efforts have primarily focused on scaling up water, sanitation and hygiene (WASH) services, increasing monitoring and disseminating information about COVID-19.<sup>6,7,17-19</sup> Many organisations have also helped obtain equipment such as personal protective equipment and ventilators for providers, as well as soap and chlorine tablets for community members.<sup>7,10,19</sup> Several organisations have reported that the country's health system has no capacity to make early case detections, to isolate and care for patients and to conduct contact tracing. Thus, efforts have primarily focused on preventive measures to mitigate the virus's impact.<sup>13</sup>

Among these efforts, few have incorporated IDP knowledge and perceptions of COVID-19 in their planning and implementation. Studies in IDP camps similar to those in Somalia warn of the profound consequences of COVID-19 in areas without a strong healthcare infrastructure, and various international health authorities have drawn attention to the grave threat the pandemic poses to these vulnerable populations.<sup>20-22</sup> An international information gap about IDP knowledge and perceptions of COVID-19 exists and inhibits providers from implementing sustainable and culturally appropriate health interventions. As such, this study examined knowledge and perceptions of COVID-19, prevalence of pre-existing conditions and access to essential health services among residents of IDP camps in Somalia. We hope that our study findings contribute to the development of potential interventions to improve the response to COVID-19 in Somali IDP camps, where some of the world's most vulnerable individuals reside.

## METHODS

### Design and instrument

A descriptive, cross-sectional survey was used to assess the current health profile, living conditions, and knowledge and perceptions surrounding COVID-19 among adults living in Somali IDP camps. Survey questions were designed using published WHO and Centers for Disease Control and Prevention (CDC) information on COVID-19 symptoms and transmission, a 2019 Displacement Severity Assessment conducted among forcibly evicted Somalis and two published studies evaluating COVID-19 knowledge in Bangladesh and Nepal.<sup>23-27</sup> Additionally, questions specific to the Somali and IDP contexts were included.

The first section of the survey focuses on demographic information, including sex, age, displacement status, household characteristics, education and employment. Response options for educational status reflect the education system in Somalia, including an option for Qur'anic education. The next section focuses on participants' health profiles, with questions probing current health status, existing conditions and symptoms. This section also includes a 12-item tool to gauge concerns brought about by COVID-19, such as potential effects on mental well-being, contracting COVID-19 or ability to buy essential food items. The third section of the survey assesses knowledge of COVID-19, most commonly used outlets for information, trusted sources of COVID-19 information and perceptions of community efforts against COVID-19. An open-ended question on COVID-19 knowledge was followed by a 23-item tool that assesses knowledge of COVID-19 and consists of true-or-false statements regarding key facts or misconceptions surrounding the disease. The final section of the survey evaluates access to WASH, COVID-19 screening and health services.

Because participants did not speak English, this survey tool was translated into Somali. Though this survey was

not assessed for reliability or validity, the Somali version of the survey was piloted in the Somali IDP context and reviewed for its content and suitability. Minor changes to the language of the Somali version were made to improve readability.

### Sample and setting

A convenience sample of 401 individuals living in 12 Somali IDP camps across six areas (Ceelasha, Lafoole, Xaawo Cabdi, Carbiska and Afgooye) of the Lower Shabelle region in Somalia, often referred to as the world's capital of IDPs, was obtained in June 2020. Participants must have been older than 18 years of age, physically able to complete the survey and willing to take part in the study. A brief presentation of the purpose, procedure and requirements for participation was given privately to each participant. Prior to the survey being interviewer-administered by multilingual and trained staff from the Hagarla Institute, verbal consent was obtained. The Hagarla Institute is a non-profit organisation dedicated to furthering clinical research, capacity building and skills transfer for medical personnel across Africa. Participants were informed that they had the right to withdraw at any time and that there would be no consequences for withdrawal. All information collected was kept confidential and anonymised.

### Data analysis

Responses from each survey were manually input onto Qualtrics survey software in English and analysed using SAS Studio V.3.8.<sup>28</sup> Sample descriptive statistics were used to report median and SD calculations for continuous variables, along with frequency and percentages of responses for categorical variables.

## RESULTS

### Sample demographics

The demographic characteristics of survey participants are shown in [table 1](#). Of the 401 eligible participants, 382 (96%) identified as IDPs and 15 (4%) identified as refugees. The vast majority of participants were female (86%, n=344), and the median age of the participants was 32.0, with a SD of 13.2 years. Most participants either had no formal education (89%, n=353) or received Qur'anic education (32%, n=126), with only 10 participants (3%) having received education past secondary school.

Participant perceptions of their health status, pre-existing health conditions, use of nicotine substances and COVID-19 symptoms are displayed in [table 2](#). While 58% (n=224) reported being in 'good' health and only 3% (n=13) reported using cigarettes or tobacco products, 50% (n=197) of participants reported having one or more of the listed pre-existing conditions. In regard to COVID-19 symptoms experienced, headache (49%, n=188) and fever (23%, n=88) were most common. Furthermore, participant concerns arising from COVID-19 are displayed in [table 3](#). Sixty-three per cent (n=243) of respondents were

**Table 1** Respondent characteristics

Characteristic	N (%)*†
<b>Sex</b>	
Female	344 (86.2)
Male	55 (13.8)
Age	32.0±13.2
<b>Status</b>	
IDP	382 (96.2)
Refugee	15 (3.8)
# of people in household	7±5.1
# of people in household over 65 years	0±3.0
<b>House or dwelling</b>	
Own	97 (24.3)
Rent	38 (9.5)
Not sure	265 (66.3)
<b>Highest level of education</b>	
No formal education	353 (88.7)
Primary school	26 (6.5)
Lower secondary school	5 (1.3)
Upper secondary school	4 (1.0)
Postsecondary/tertiary school	7 (1.8)
Graduate degree (eg, master's, doctorate)	3 (0.8)
Qur'anic education	126 (31.7)
<b>Work in the past 7 days</b>	
Yes	190 (47.5)
No	210 (52.5)

\*Values are frequency (percentage) for categorical variables; median±SD for continuous variables.

†Values may not add to 100%.

IDP, internally displaced person.

concerned about getting adequate physical exercise, and 66% (n=259) were worried about getting COVID-19. When asked how COVID-19 has changed their daily lives, 235 participants (59%) indicated that the nationwide lockdown as a result of COVID-19 had decreased their income or caused them to lose their job (not shown). In addition, approximately 10% (n=37) of respondents expressed concerns surrounding social dynamics and conflict within the household stemming from COVID-19.

### KNOWLEDGE AND PERCEPTIONS OF COVID-19

[Table 4](#) presents participant responses to true or false questions surrounding COVID-19. Roughly 50% of responses to the question series were 'I don't know'. The majority of participants indicated that they did not know the current possible treatment (83%, n=327), symptoms (50%, n=201) or incubation period of COVID-19 (79%, n=313), and 60% (n=237) reported being unfamiliar with social distancing (not shown). Similarly, 63% (n=250)

**Table 2** Respondent health profiles

Characteristic	N (%) <sup>*†</sup>
<b>Perception of health status</b>	
Good	224 (57.6)
Fair	101 (26.0)
Poor	64 (16.5)
<b>Pre-existing health conditions</b>	
Diabetes	5 (1.6)
Anaemia	76 (23.6)
Hypertension	5 (1.4)
Lung disease (Chronic obstructive pulmonary disease)	3 (0.8)
Cancer	1 (0.3)
Asthma	7 (1.8)
Malaria	52 (14.1)
Dengue fever	3 (0.8)
Oral/tooth disease	7 (1.8)
Disability or injury from accident	18 (4.7)
Sexually transmitted infection or fertility disorder	84 (23.4)
Mental illness or psychiatric condition	2 (0.6)
Other health condition	36 (10.0)
<b>Use of tobacco or cigarettes</b>	
Yes	13 (3.3)
<b>Exhibiting symptoms</b>	
Headache	188 (48.5)
Fever	88 (23.0)
Skin rash	23 (6.0)
Dry cough	19 (5.0)
Wet cough or sputum/mucus production	5 (1.3)
Sore throat	10 (2.6)
Runny nose or nasal congestion	3 (0.8)
New loss of taste and/or smell	19 (4.9)
Shortness of breath or difficulty breathing	10 (2.6)
Diarrhoea	9 (2.3)
Muscle or body aches	52 (13.6)
Fatigue or malaise	20 (5.2)
One of the following: fever, dry cough and fatigue	49 (12.8)
Two of the following: fever, dry cough and fatigue	22 (5.7)
All of the following: fever, dry cough and fatigue	6 (1.8)
At least one of the following: fever, dry cough and fatigue	53 (13.7)

\*Values are frequency (percentage).

†Values may not add to 100%.

did not know that asymptomatic individuals could spread the virus. However, a sizeable proportion of participants were able to recognise headache (34%, n=135), fever (45%, n=179), cough (35%, n=139) and shortness

of breath or difficulty breathing (31%, n=12) as symptoms of COVID-19 (not shown). Still, the proportion of participants who were not familiar with basic background information surrounding COVID-19 was higher than the proportion who answered questions correctly.

Participants most used and trusted sources of information surrounding COVID-19 are displayed in table 5. About 49% (n=190) and 57% (n=225) of participants reported that they trusted religious officials and the radio, respectively, to provide information about COVID-19, while only 37% (n=144) and 5% (n=19) said that they trusted health officials and humanitarian aid workers, respectively. Ninety percent (n=360) of participants reported receiving information on COVID-19 from traditional media services (radio, television and newspapers). A majority of respondents indicated that they felt that healthcare workers and the government were working together 'moderately' or 'a lot' to prevent the spread of COVID-19 (table 6). However, only 4% (n=11) of respondents stated that they would go to health information providers in IDP camps if they suspected they had contracted the virus (not shown).

### Access to treatment and preventative services

Table 7 reports participants' access to essential services, preventative resources and treatments for COVID-19. A majority lacked access to washing facilities (71%, n=277), soap (67%, n=256), disinfectants (98%, n=382) and face masks (89%, n=373). Although respondents lacked access to such resources, they still reported carrying out basic preventative procedures such as washing hands more often (74%, n=292) and avoiding shaking hands (57%, n=222) (not shown). While only 5% (n=20) and 25% (n=98) of participants reported using more disinfectants and practising social distancing, 77% (n=296) reported having taken at least one preventative action (not shown). Moreover, 34% (n=135) of respondents reported not being able to buy essential food items in the last week. Of those, 74% (n=100) reported having either to skip and eat smaller meals or buy lower quality food (not shown).

Additionally, 185 (47%) respondents indicated that camp living conditions needed to change to prevent the spread of COVID-19 (not shown). In short answer responses, 142 (80%) respondents expressed desires for improved sanitation, hygiene or housing conditions, and 14 (8%) specifically indicated their desire for more stringent social distancing practices. However, 40% (n=159) indicated that it would be impossible to self-isolate if taken ill (not shown).

Furthermore, respondents' self-reported access to COVID-19 screening and medical services was low, with 97% (n=381) saying that they could not access screening and only 20% (n=79) stating that they were confident that they could receive medical services if infected. Participants reported accessibility issues, with 48% (n=191) stating that there was no healthcare facility nearby. Of those, 31% (n=61) said that it would take over an hour to reach a healthcare facility (not shown). About 59% of

**Table 3** Concerns brought on by COVID-19

Question	Yes n (%) <sup>*†</sup>	No n (%) <sup>*†</sup>	Not sure n (%) <sup>*†</sup>
Getting adequate exercise/movement	243 (62.6)	135 (34.8)	10 (2.6)
Mental health and well-being	85 (22.1)	244 (63.5)	55 (14.3)
Job security	198 (51.2)	155 (40.1)	34 (8.8)
Social distancing	71 (18.7)	292 (77.0)	16 (4.2)
Social isolation in the case of infection	53 (13.6)	321 (82.5)	15 (3.9)
Covering living expenses	39 (10.0)	277 (71.0)	74 (19.0)
Caring for children	36 (9.5)	332 (87.6)	11 (2.9)
The education of your child(ren)	45 (11.6)	330 (85.3)	12 (3.1)
Social dynamics/conflict within the home	37 (9.6)	271 (70.0)	79 (20.4)
Worried about getting COVID-19/coronavirus	259 (65.6)	99 (25.1)	37 (9.4)
Worried about loved ones getting COVID-19/coronavirus	265 (68.0)	93 (23.9)	32 (8.2)

\*Values are frequency (percentage).

†Values may not add to 100%.

participants indicated that they had received a vaccination for any condition in the past few years (n=232) (not shown), and only 54% (n=215) expressed that vaccines were accessible to them.

## DISCUSSION

This study is the first to explore knowledge and perceptions of COVID-19, access to essential services and COVID-19 symptoms and risk factors among individuals living in IDP camps in Somalia. To our knowledge, it is also one of few studies that document knowledge of COVID-19 and prevalence of COVID-19 symptoms and risk factors among displaced populations globally. Overcrowding, limited access to WASH services and a lack of health infrastructure leave displaced populations living in IDP camps particularly vulnerable to the spread of infectious disease such as COVID-19.<sup>2</sup>

### Respondent health profile

A considerable proportion of our sample reported experiencing symptoms that could potentially be attributed to COVID-19, including headache, fever, or muscle or body aches.<sup>29</sup> Previous studies on health profiles of displaced populations living in such settings are unavailable in Somalia and are sparse in international settings, limiting the potential for cross-comparison. However, compared with a similar study conducted in refugee camps in Bangladesh, our sample exhibited higher proportions of individuals experiencing fevers, headaches, shortness of breath, loss of taste or smell, and muscle or body aches.<sup>27</sup> In addition, our study findings reinforce concerns put forward in the literature regarding the spread of COVID-19 in humanitarian settings, including adequate exercise, mental health and well-being, job security, social distancing, conflict within the home and food insecurity.

These concerns should serve as priority areas for health and social service providers to engage with and address.

Though the rate of tobacco and cigarette use in our sample appears to be consistent with smoking prevalence in Somalia, especially when considering the majority of our sample consisted of women, our study found a lower rate of tobacco use when compared with other studies conducted in similar limited-resource settings.<sup>30,31</sup> Furthermore, although little information is available regarding the health conditions of individuals living in IDP camps globally, self-reported pre-existing conditions from our sample appear to be considerably low, particularly for chronic and mental health conditions, when compared with values expected from the literature.<sup>32–35</sup> Health staff administering surveys reported that many participants did not know what the surveyed conditions were, had little recollection of previous diagnoses and had rarely visited a health professional in the past. This is consistent with the significant lack of formal education among participants and lack of access to health facilities and may explain the lower reported prevalence of chronic, pre-existing conditions found in this study.

### Knowledge and perceptions of COVID-19

This study found very poor knowledge related to COVID-19 and relevant universal safety measures among individuals living in Somali IDP camps. Though there is limited literature on this topic, especially in camp-like or humanitarian contexts, our sample exhibited significantly poorer knowledge of COVID-19 and safety measures, as compared with studies conducted in China, the USA, the UK and Nepal.<sup>26,36,37</sup> Although related literature in humanitarian settings is severely limited, this disparity persists in the sparse COVID-related published research in camp-like settings, such as that of a study conducted in Cox's Bazar, Bangladesh.<sup>27</sup> These findings may be

**Table 4** Knowledge of COVID-19

Statement	Correct n (%) <sup>*†</sup>	Incorrect n (%) <sup>*†</sup>	Not sure n (%) <sup>*†</sup>
People showing no symptoms of being sick can spread a virus or contagious disease (true)	150 (37.5)	30 (7.5)	220 (55.0)
It is possible to contract a virus or contagious disease by touching a surface or object that has the virus on it (true)	191 (48.0)	6 (1.5)	201 (50.5)
Antibiotics can be used to treat COVID-19/coronavirus (false)	36 (9.1)	51 (12.8)	311 (78.1)
Antibiotics can be used to prevent infection from COVID-19 (false)	37 (9.4)	44 (11.2)	313 (79.4)
People of all ages can become infected with COVID-19/coronavirus (true)	206 (51.8)	19 (4.8)	173 (43.3)
People of all racial, religious and ethnic groups can become infected with COVID-19/coronavirus (true)	199 (50.4)	17 (4.3)	179 (45.3)
Eating garlic, ginger, black pepper or lemon can lower your chances of getting infected with COVID-19/coronavirus (false)	12 (3.0)	248 (62.8)	135 (34.2)
COVID-19 spread from humans to humans, mainly through respiratory droplets (true)	199 (50.6)	13 (3.3)	181 (46.1)
COVID-19 can also spread from feco–oral route (true)	111 (28.1)	34 (8.6)	250 (63.3)
COVID-19/coronavirus is just like the influenza (false)	20 (5.1)	214 (54.0)	162 (40.9)
Maintaining good personal hygiene and being socially responsible would help limit the spread of COVID-19/coronavirus (true)	252 (64.5)	56 (14.3)	83 (21.2)
Washing hands frequently using soap or the use of sanitiser would help limit the spread of COVID-19/coronavirus (true)	253 (64.9)	55 (14.1)	82 (21.0)
Avoiding handshaking behaviour would help limit the spread of COVID-19/coronavirus (true)	219 (56.7)	65 (16.8)	102 (26.4)
Avoiding placing fingers into eyes, nose and mouth would help limit the spread of COVID-19/coronavirus (true)	181 (47.0)	74 (19.2)	130 (33.8)
Coughing and sneezing into the elbow or within the clothing is a good practice in helping to limit the spread of COVID-19/coronavirus (true)	209 (54.4)	64 (16.7)	111 (28.9)
Limiting eating meat, eggs and fishes would help limit the spread of COVID-19/coronavirus (false)	153 (39.8)	116 (30.2)	115 (30.0)
Following social distancing measures and avoiding crowded places would help limit the spread of COVID-19/coronavirus (true)	172 (44.7)	76 (19.7)	137 (35.6)
For someone without any symptoms of COVID-19/coronavirus, wearing a face mask is considered an appropriate and protective measure against COVID-19/coronavirus (true)	144 (37.4)	100 (26.0)	141 (36.6)
Proper usage of face mask during an outbreak should include covering nose, mouth and chin with the coloured side facing outside (true)	167 (43.4)	64 (16.6)	154 (40.0)
Staying at home would play a significant role in helping to limit the spread of COVID-19/coronavirus (true)	215 (56.0)	84 (21.9)	85 (22.1)
A person with pre-existing medical conditions such as heart diseases, diabetes, hypertension and cancer are at greater risk of COVID-19/coronavirus related infection (true)	172 (44.7)	64 (16.6)	149 (38.7)
COVID-19/coronavirus can only infect old people (false)	195 (50.9)	69 (18.0)	119 (31.1)
There is no chance of survival once the person is infected with COVID-19/coronavirus (false)	195 (52.3)	67 (18.0)	111 (29.8)

\*Values are frequency (percentage).

†Values may not add to 100%.

**Table 5** Respondent trusted sources of information surrounding COVID-19

Source	n (%)*
<b>Sources of information</b>	
News, media (eg, TV, radio and newspapers)	360 (90.0)
Informational calls/SMS	161 (40.3)
Social media (eg, Facebook, Twitter, WhatsApp, YouTube, Instagram and Snapchat)	21 (5.3)
Official government/international websites (eg, Ministry of Health, WHO and CDC)	10 (2.5)
Family members, colleagues and friends	38 (10.0)
Employer, work colleagues, and others at work	7 (1.8)
Non-governmental organisations	21 (5.3)
Informational campaigns	17 (4.3)
Local or community leaders	8 (2.0)
Journals	8 (2.0)
<b>Trust in sources to provide COVID-19 information</b>	
Family members	162 (41.3)
Religious official	190 (48.5)
Community elder	31 (8.0)
Health official	144 (36.7)
Humanitarian aid worker	19 (4.8)
Social media	17 (4.3)
Web news	9 (2.3)
Television	41 (10.5)
Radio	225 (57.4)

\*Values are frequency (percentage).

attributed to the lack of formal education among study participants and the reality that Somalia has some of the lowest health and health literacy indicators in the world, which stem from decades of conflict, civil strife and limited access to healthcare and education, particularly for displaced populations like IDPs.<sup>38–41</sup>

The importance of education as a preventative measure in controlling the transmission of COVID-19 in camp

settings cannot be understated. Given significant gaps in COVID-19 knowledge among Somali IDP camp residents, instituting precautionary measures, including public awareness campaigns, is of paramount importance. Knowledge is a critical determinant of health behaviours, and through targeted educational interventions, IDP camp residents can play an essential role in preventing community spread of the virus.<sup>42</sup> Through highly used information platforms identified in this study, such as news and media outlets and informational calls or text messages, educational programmes can be codesigned with those living in IDP camps to address COVID-19 knowledge gaps, to disseminate information about COVID-19 prevention and treatment and to build trust between health providers and IDPs. Similarly, trusted sources, such as religious officials and the radio, can be mobilised to engage with community members and to dispel misinformation about COVID-19.

### Access to treatment and preventative services

Our study reveals a significant lack of access to treatment and preventative services for COVID-19 among individuals living in IDP camps, which is consistent with other assessments of access to health and WASH services in Somalia and camp-like settings in other countries.<sup>2 43–45</sup> Of particular note, the lack of access to COVID-19 screening tests suggests that cases may go undetected and spread rapidly within overcrowded camp settings. Similarly, our sample's reported lack of access to any vaccines may inhibit adequate uptake of a COVID-19 vaccine among this vulnerable population. These findings reflect the lack of access to services necessary to prevent COVID-19 transmission and suggest a lack of access to services that may exacerbate known comorbidities of COVID-19, such as hypertension, cancer, cardiovascular disease and diabetes, which are increasingly difficult to provide continuous care for during the COVID-19 pandemic.<sup>1 4</sup> Generally, respondents reported limited confidence that they would be able to be treated if they contracted the virus, as well as an inability to participate in preventative measures due to a lack of material resources such as face masks and disinfectants, lack of information about COVID-19 prevention measures and inadequate living conditions to enforce social distancing protocols. Consistent with similar studies conducted with displaced populations in the Democratic Republic of the Congo and Syria, these

**Table 6** Faith in community action against COVID-19

Question	Not at all*	Somewhat*	Moderately*	A lot*
To what extent do you feel like your community is working together to prevent the spread of COVID-19/coronavirus?	65 (16.4)	119 (30.0)	102 (25.7)	111 (28.0)
To what extent do you feel like the healthcare workers, your government and other providers are working together to prevent the spread of COVID-19/coronavirus?	46 (11.6)	61 (15.4)	90 (22.7)	200 (50.4)

\*Values are frequency (percentage).

**Table 7** Essential resources for COVID-19 response

Question	Yes n (%)*†	No n (%)*†
Access to clean water or a clean water source	362 (91.6)	33 (8.4)
Access to washing facilities	113 (29.0)	277 (71.0)
Access to soap	129 (33.6)	256 (66.5)
Access to disinfectants, such as hand sanitisers and cloth wipes	8 (2.1)	382 (98.0)
Ability to buy essential food items	261 (65.9)	135 (34.1)
Access to face masks	43 (10.9)	351 (89.1)
Ability to maintain clean and sanitary conditions at home	325 (81.9)	69 (17.4)
Access to nearby healthcare facility	194 (49.0)	191 (48.2)
Confident in ability to access healthcare if infected with COVID-19	79 (20.0)	275 (69.4)
Access to vaccines	215 (54.2)	174 (43.8)
Access to COVID-19/coronavirus screening	6 (1.5)	381 (96.9)

\*Values are frequency (percentage).

†Values may not add to 100%.

findings reinforce the necessity for substantial investment in improving access to health and WASH services for those living in camps, beginning with providing consumables such as soap and face masks to implement COVID-19 safety precautions and individual family accommodations such as tarpaulin tents to allow IDPs to practice distancing measures.<sup>46 47</sup>

### Limitations

This study's sampling methodology is subject to several limitations. First, participants were recruited from 12 Somali IDP camps across six areas (Ceelasha, Lafaole, Xaawo Cabdi, Carbiska and Afgooye) of the Lower Shabelle region, which limits the generalisability of the study findings to IDP camps in other areas of Somalia. That being said, the Lower Shabelle region harbours one of the largest IDP populations in Somalia, as well as one of the highest concentrations of individuals in need of humanitarian support.<sup>48</sup> Similarly, our analysis did not disaggregate data by IDP camp. Future studies should identify the challenges faced by IDP communities outside of the Lower Shabelle region and should explore circumstances unique to each camp setting, such that tailored interventions can be effectively designed. Second, because an overwhelming majority of participants surveyed (86.2%) were women, the generalisability of the study results to males living in IDP camps may be limited. Third, the respondent health profiles reported (table 2) consist exclusively of self-reported data. As such, the limited reliability of participant responses for pre-existing conditions must be noted. Finally, given that this study uses a cross-sectional survey design, it cannot be used to analyse the evolution of COVID-19 knowledge, health conditions and access to services in Somali IDP camps over an extended period of time.

### CONCLUSION

Ultimately, this study provides strong evidence for immense gaps in knowledge and perceptions of COVID-19 and access to treatment and preventative services among individuals living in Somali IDP camps. This study also provides insight into the health profile of IDP camp residents, as well as their concerns during the COVID-19 pandemic. A massive influx of additional resources and targeted interventions will be required to adequately address COVID-19 in Somalia, starting with educating those individuals most vulnerable to infection. Future research is needed to further elucidate the health profile of camp residents and the most at-risk individuals and to identify entry points to facilitate the implementation of COVID-19 prevention and treatment measures, taking into account the perspectives of IDP camp residents and relevant stakeholders. International organisations operating within Somalia, as well as the Somali government, should view investments in addressing COVID-19 as long-term investments in sustainable health infrastructure, as well as the health and prosperity of its population.

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**Patient consent for publication** Not required.

**Ethics approval** This study received approval from the ethics board at SIMAD University in Somalia and was deemed exempt from review by the Yale IRB (ID #2000028344). Verbal consent to participate in the study was obtained privately



from each participant prior to the survey being interviewer-administered by trained staff from the Hagarla Institute. If a participant consented, they were informed of their right to withdraw at any time without any consequences and were presented with a brief overview of the study before any survey questions were administered. All information collected was confidential and anonymised.

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**Data availability statement** All data relevant to the study are included in the article or uploaded as supplementary information.

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