






# BMJ Open Misconceptions about COVID-19 among older Rohingya (forcibly displaced Myanmar nationals) adults in Bangladesh: findings from a cross-sectional study

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## ABSTRACT

**Objectives** Due to low health literacy and adverse situation in the camps, there are possibilities of misconceptions related to COVID-19 among the older Rohingya (forcibly displaced Myanmar nationals or FDMNs) adults in Bangladesh. The present research aimed to assess the level of misconceptions and the factors associated with it among the older FDMNs in Bangladesh.

**Design** Cross-sectional.

**Setting** A selected Rohingya camp situated in Cox's Bazar, a southeastern district of Bangladesh.

**Participants** Information was collected from 416 conveniently selected FDMNs who were aged 60 years and above.

**Primary and secondary outcome measures** The primary outcome was misconceptions related to the spread, prevention and treatment of COVID-19. Information on 14 different locally relevant misconceptions was gathered, each was scored as one, and obtained a cumulative score, ranging from 0 to 14, with a higher score indicating a higher level of misconceptions. A multiple linear regression model explored the factors associated with misconceptions.

**Results** The participants had an average of five misconceptions. The most prevalent misconceptions were: everyone should wear personal protective equipment when outside (84.6%) and its prevention by nutritious food (62.5%) and drinking water (59.3%). Other notable misconceptions included the spread of COVID-19 through mosquito bites (42%) and its transmissions only to the non/less religious person (31.4%). In regression analyses, memory or concentration problems, communication frequency with social networks, pre-existing conditions and receiving information from health workers were significantly associated with higher COVID-19 misconceptions. These misconceptions were less likely among those overwhelmed by COVID-19, having COVID-19 diagnosed friends or family members and receiving information from friends and family.

**Conclusions** Overall, we found that misconceptions were prevalent among the older FDMNs in Bangladesh. The associations have important implications for programmes

## Strengths and limitations of this study

- The study was conducted among the Rohingya (forcibly displaced Myanmar nationals or FDMNs) older adults in Bangladesh, who are vulnerable to having misconceptions related to COVID-19.
- As we conveniently selected the participants from the selected Rohingya camp, there is possibilities of selection bias.
- The study was carried out in a single camp that limits the generalisability of the findings for the entire camp population.
- Since the study was cross-sectional in nature, no temporal relationship is possible.
- The findings are self-reported and relied on participants recall; therefore, recall bias is possible.

to prevent and manage COVID-19 in these settings. Health workers need to be adequately trained to provide clear communication and counter misconceptions.

## BACKGROUND

As of 8 February 2021, the ongoing COVID-19 pandemic has claimed over 2.3 million lives globally and added over 100 million confirmed cases to the global burden of disease.<sup>1</sup> By the same date, Bangladesh reported over 538 thousand COVID-19 confirmed cases and 8205 COVID-19 deaths.<sup>1</sup> Although the knowledge of different aspects of COVID-19 is still emerging, the available evidence consistently shows the disproportional impact of COVID-19, making one subpopulation more vulnerable than others.<sup>2 3</sup> One such vulnerable population is older adults, who are at increased risk of mortality, severe illness and often require hospitalisation and intensive care for COVID-19.<sup>4</sup> Notably, 8 out of 10



COVID-19 deaths in the USA have been reported among adults aged 65 years and older.<sup>5</sup>

COVID-19 has reminded us how interconnected the world is, and it impacts everyone—people on both sides of the borders as well as the refugees and other displaced people. Refugees and displaced people are at the greatest risk of COVID-19 because, on the one hand, they live in densely populated camps that lack basic sanitation, which makes social distancing and hand washing or maintaining personal hygiene difficult.<sup>6</sup> On the other hand, their access to health services may be limited, which may preclude them from the diagnostics and clinical management in the events of an outbreak.<sup>7</sup>

The Rohingyas (forcefully displaced Myanmar nationals or FDMNs) are mostly Muslim minority resident of Myanmar's Rakhine State who faced decades of systematic discrimination, statelessness and targeted violence by Myanmar's military that forced them to flee the Rakhine state and seek refuge in several Asian countries but mostly in neighbouring Bangladesh.<sup>8,9</sup> Although there have been ongoing discriminations and violent attacks, the spikes in violence and subsequent mass displacements in 1978, 1991–1992, 2016 and again in 2017 drew international attention.<sup>10,11</sup> The FDMNs influx into Bangladesh in 2017 is considered the largest and fastest of these movements and involved about a million Rohingya, joining nearly 300 000 people who had previously fled Myanmar.<sup>12</sup> They live in refugee camps in Cox's Bazar, a south-eastern district of Bangladesh, about 280 km away from Rakhine state of Myanmar (the place from where they were displaced), which is now the world's largest camp for displaced people.<sup>13,14</sup> The United Nations Refugee Agency indicates more than 31 500 FDMNs in the camps to be aged 60 years and older.<sup>15</sup>

A previous study demonstrated that people in Rohingya camps are at increased risk of COVID-19.<sup>16</sup> High population density (40 000 people per square kilometre) and poor sanitation facilitate the spread of COVID-19 in the Rohingya camps.<sup>14</sup> More than half of the Rohingya population faces water supply shortages, and >30% of the households do not have access to soap.<sup>17</sup> While data specifically on older Rohingya is unavailable, recent evidence suggests a high prevalence of non-communicable diseases (NCDs), particularly hypertension (51.5%) and diabetes (14.2%),<sup>18–20</sup> among the Rohingya adults, which increases their risk of COVID-19 related complications. Furthermore, the real burden of NCDs among Rohingya could be illustrated by the 'iceberg phenomenon' of disease whereby inadequate screening and diagnosis of NCDs in Rohingya camps may have underestimated the actual burden.<sup>14</sup>

The role of nutrition in inferring immunity is undebatable. Food insecurity and malnutrition are common among FDMNs<sup>21</sup> and could further increase their susceptibility to infections. These factors, coupled with the biological senescence, make Rohingya older adults a highly at-risk group for COVID-19. As of 2 February 2021, a total of 5886 COVID-19 positive cases have been

confirmed in the Cox's Bazar district, of which 381 are in the Rohingya camps, and the numbers are rapidly increasing.<sup>22</sup> However, health professionals consider the number of known cases to be low because factors such as the fear of deportation, isolation in quarantines and separation from their families preclude FDMNs from taking testing voluntarily.<sup>23</sup>

During this pandemic, public health professionals are not just fighting the pandemic but also the array of COVID-19 misinformation that has spread globally. Top officials from the United Nations and the WHO have warned against the 'pandemic of misinformation' or 'infodemic'. Specifically, among refugee and displaced populations, the misinformation, disinformation, myths and misconceptions are likely to flourish because of lower literacy and limited access to reliable sources of information such as health services or health professionals.<sup>24,25</sup> In September 2019, Bangladeshi authorities cut-off access to telecommunications and the internet in the camps, thus barring the residents from accessing information and facilitating to flourish fear, misinformation, stigma and stereotypes about COVID-19 in the camps.<sup>26</sup> Later, although the services were restored, they were poorly accessible and rarely used by older adults. Furthermore, among Rohingya, social and religious taboos, and orthodox thinking, which is more common among older members, can contribute to misconceptions. When interviewed by Amnesty International in April 2020, most older people reported that they had received little specific information about COVID-19.<sup>27</sup>

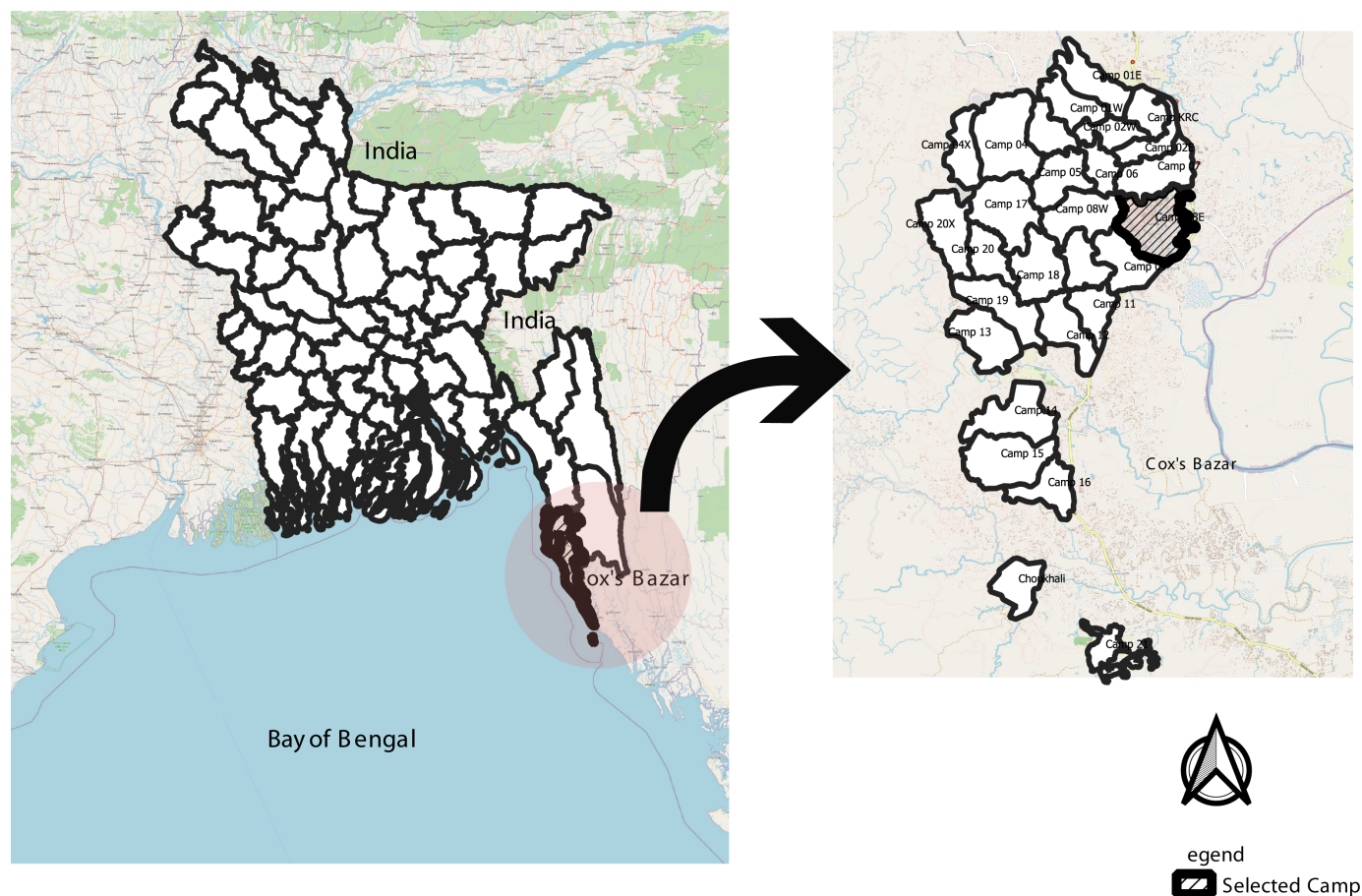
In the Bangladeshi population and more specifically among FDMNs, it is a big challenge to clarify and address myths and misconceptions.<sup>28</sup> Identifying and demystifying prevalent misconceptions is crucial, especially during a pandemic, as accurate public health information can help prevent infection and promote health measures. The level of misconceptions related to COVID-19 has not been well described among the FDMNs, particularly among the older adults who are the most vulnerable. Therefore, the present study aimed to assess misconceptions and their correlates among the older FDMNs in Bangladesh.

## METHODS

### Study design and participants

The study followed a cross-sectional design and was conducted by Aureolin Research, Consultancy and Expertise Development Foundation among the FDMNs from the Rohingya camps situated in the Cox's Bazar district in the southeastern part of Bangladesh in October 2020.

The sample size of 460 was calculated with the following assumptions: (unknown) prevalence of COVID-19 related misconceptions=50%, sampling error=5%, CI=95% and non-response rate=20%. Of the 457 eligible participants approached, a total of 416 Rohingya older adults responded to the study (response rate 91%). There is a total of 34 Rohingya camps located in Cox's Bazar district from which Camp 08E (SSID CXB-210), located at *Ukhia*



**Figure 1** Geographical location of the study area (source: Site Management Sector, Office of the Refugee Relief & Repatriation Commissioner, Inter Sectoral Coordination Group). Retrieved from [https://data.humdata.org/dataset/1a67eb3b-57d8-4062-b562-049ad62a85fd?fbclid=IwAR0N\\_GqOqP7FwcoGMUEiZu4Sj5uOPPrD86cPHOmqfy9O3oGzCCoCki9ItY](https://data.humdata.org/dataset/1a67eb3b-57d8-4062-b562-049ad62a85fd?fbclid=IwAR0N_GqOqP7FwcoGMUEiZu4Sj5uOPPrD86cPHOmqfy9O3oGzCCoCki9ItY).

subdistrict, was conveniently selected (figure 1). In the absence of the list of the older adults in Rohingya camps, a convenient sampling technique was used to identify the eligible participants in the selected camp. The surveyors continued visiting the households until the desired sample size was achieved. If the approached household did not have an eligible participant, the surveyors moved to the next one, and if the household had more than one older adults, all of them were interviewed. The inclusion criteria included age  $\geq 60$  years and FDMN status. The exclusion criteria included adverse mental conditions (clinically proved schizophrenia, bipolar mood disorder and dementia/cognitive impairment), a hearing disability or unable to communicate.

## Measures

### Outcome measure

The primary outcome of the study was the level of misconceptions related to COVID-19. WHO has compiled a list of the most common COVID-19 ‘MythBusters’.<sup>29</sup> Our survey included locally relevant misconceptions, such as transmission through mosquitoes’ bites, transmitted only to people who practice ‘socially unacceptable activities’, and so forth. We also included items from an African study that shed light on additional misconceptions such

as antibiotics being effective for treatment and home-made remedies to cure COVID-19. We prepared a list of 14 different misconceptions, related to the spread, prevention and treatment of COVID-19. Each item on misconceptions was assessed as a true/false statement. Each misconception scored one, and the correct responses were assigned 0. The cumulative score of the 14-items ranged from 0 to 14, with a higher score indicating a higher level of misconceptions.

### Explanatory variables

Explanatory variables considered in this study were age (categorised as 60–69, 70–79 and  $\geq 80$  years), sex (male/female), marital status (currently married/single), literacy (yes/no), family size ( $\leq 4$  and  $> 4$ ), living arrangements (living with other family members/living alone), dependence on family for a living (yes/no), source of COVID-19 related information (radio/television, health workers and friends/family/neighbours), walking distance from nearest health centre ( $< 30$  min/ $\geq 30$  min), memory or concentration problem (no problem/low memory or concentration), feeling concerned about COVID-19 (hardly and sometimes/often) feeling overwhelmed because of COVID-19 (hardly and sometimes/often), presence of any NCDs

(yes/no), frequency of communication with others during COVID-19 (less than previous/same as previous) and COVID-19 diagnosis among close friends or family members (yes/no).

Information on pre-existing conditions such as arthritis, hypertension, heart diseases, stroke, hypercholesterolaemia, diabetes, chronic respiratory diseases, chronic kidney disease and cancer were collected by self-reported. This information was verified with available health records if available and/or with family members. We did not collect information on the income and occupation as the refugee population is mostly unemployed and dependent on aid funding.

### Data collection tools and techniques

A pretested semistructured questionnaire in the Bengali language was used to collect the information through face-to-face interviews while adhering to COVID-19 related health safety measures. Data were electronically recorded in SurveyCTO mobile app (<https://www.surveyccto.com/>) by eight research assistants, who were local residents of Cox's Bazar, fluent in Rohingya dialects and had previous experience of administering health survey on an electronic platform. The research assistants were trained extensively before the data collection through the Zoom meeting.

Two team members first translated the original English version of the questionnaire into Bengali language and then back-translated to English to ensure the contents' consistency. The Bengali version of the tool was piloted among a small sample (n=10) of Rohingya older adults from the selected camp to refine the language in the final version. The pretest samples were not included in the final study.

### Statistical analyses

The distribution of the variables was assessed through descriptive statistics. To explore the factors associated with misconceptions among the participants, we used the multiple linear regression model. The previously described cumulative misconception score, range 0–14, was the outcome variable for regression analyses, and we used the backward elimination criteria with Akaike information criterion (AIC) to select the final model. Adjusted beta-coefficient ( $\beta$ ) and 95% CI are reported in the main table, and the model diagnostics results, such as normality of the residuals and multicollinearity, are reported in online supplemental files 12. All analyses were performed using the statistical software package Stata (V.14.0).

### Patient and public involvement in research

Neither patients nor the public were involved in the design or conduct of this study. Participants also did not contribute to the writing or editing of this manuscript. Informed written consent was sought from each participant before the interview.

## RESULTS

### Participants' characteristics

As summarised in [table 1](#), of the total 416 older Rohingya FDMNs aged 60 years and above, the majority were in their 60s (74%), male (60.3%), married (93.5%), illiterate (97.6%) and coresided with other family members (87.0%). Over half (54.1%) of the participants reported dependency on family members for living, and most (79.3%) resided within 30 min walking distance from the nearest health facility. The most common sources of COVID-19 related information among the participants were health workers (72.2%) and friends/family/neighbours (64.7%). Half reported feeling overwhelmed due to the pandemic, and two in five were concerned about it. Social interactions were reduced as 59% reporting less frequent communication with others during the pandemic. One in ten (12%) reported COVID-19 diagnosis in close friends or relatives.

### Prevalence of COVID-19 misconceptions

Participants' misconceptions related to the spread, prevention and treatment of COVID-19 are presented in [table 2](#). On average, participants had misconceptions about five items (mean misconception score=4.6 and range 0–11). The most prevalent misconceptions were those related to the prevention of COVID-19 and included misconceptions about wearing personal protective equipment (PPE) when outdoors (84.6%) and its prevention by nutritious food (62.5%) and drinking water (59.3%). Four in 10 participants believed that COVID-19 spreads through mosquito bites (42%). Other notable misconceptions included participants' belief that COVID-19 transmits only to non/less-religious people (31.4%) and those who conduct socially unacceptable activities (25.7%). Although one-fifth of the participants had misconceptions that doctors could cure COVID-19, relatively, participants were accurately informed that it could not be cured by antibiotics and traditional healers ([table 2](#)).

### Factors associated with COVID-19 misconceptions

The full model included the demographic and lifestyle characteristics and COVID-19 related variables ([table 1](#)) deemed to be associated with misconceptions. The final model, based on the lowest AIC, retained the variables shown in [table 3](#). Hence, the model is adjusted for all the variables in [table 3](#). In the adjusted model, memory/concentration problems, pre-existing conditions, information sources for COVID-19, overwhelmed by COVID-19, frequency of communication and COVID-19 diagnosis of close friends or family members were significantly associated with COVID-19 misconceptions among study participants ([table 3](#)). Average misconception scores were 0.88 units higher among participants reporting low memory or concentration problems than those with no such problems ( $\beta$ : 0.88, 95% CI 0.31 to 1.44). Similarly, the misconception scores were 5.88 units higher among those with pre-existing chronic conditions ( $\beta$ : 5.88, 95% CI 2.68 to

**Table 1** Characteristics of the participants (n=416)

Characteristics	N	%
<b>Age (year)</b>		
60–69	308	74.0
70–79	83	20.0
≥80	25	6.0
<b>Sex</b>		
Male	251	60.3
Female	165	39.7
<b>Marital status</b>		
Married	389	93.5
Single	27	6.5
<b>Literacy</b>		
Illiterate	406	97.6
literate	10	2.4
<b>Family size</b>		
0–4	167	40.1
>4	249	59.9
<b>Living arrangement</b>		
Living with family members	362	87.0
Living alone	54	13.0
<b>Dependent on the family for living</b>		
No	191	45.9
Yes	225	54.1
<b>Walking distance to the nearest health centre</b>		
<30 min	330	79.3
≥30 min	86	20.7
<b>Memory or concentration problems</b>		
No problem	356	85.6
Low memory or concentration	60	14.4
<b>Pre-existing chronic conditions</b>		
No	295	70.9
Yes	121	29.1
<b>*Sources of COVID-19 related information</b>		
Radio/television	178	42.8
Health workers	298	72.2
Friends/family/neighbours	267	64.7
<b>Concerned about COVID-19</b>		
Hardly	256	61.5
Sometimes/often	160	38.5
<b>Overwhelmed by COVID-19</b>		
Hardly	243	49.1
Sometimes/often	173	50.9
<b>Feeling left out during the pandemic</b>		
Hardly	274	65.9
Sometimes/often	142	34.1
<b>Frequency of communication during COVID-19</b>		

Continued

**Table 1** Continued

Characteristics	N	%
Same as previous	170	40.9
Less than previous	246	59.1
<b>Close friends or family members diagnosed with COVID-19</b>		
No	367	87.9
Yes	49	12.1

\*Multiple responses so total percentage may not equal 100.

12.93), 0.53 units higher among those receiving COVID-19 information from health workers ( $\beta$ : 0.53, 95% CI 0.01 to 1.04) and 3.19 units higher among the participants who less frequently communicated with friends and relatives during the pandemic ( $\beta$ : 3.19, 95% CI 2.67 to 3.70). However, the misconception scores were 1.03 units lower among participants receiving COVID-19 related information from their friends, family and neighbours ( $\beta$ : -1.03, 95% CI -1.55 to -0.52) compared with those who did not, 0.96 units lower among participants overwhelmed by the pandemic ( $\beta$ : -0.96, 95% CI -1.46 to -0.46) and 2.33 units lower among participants who had close friends or family members diagnosed with COVID-19 ( $\beta$ : -2.33, 95% CI -3.43 to -1.22).

## DISCUSSION

This study assessed the misconceptions about the spread, prevalence and treatment of COVID-19 among older Rohingya FDMNs in Bangladesh and found many prevalent misconceptions. One apparent reason for the prevailing misconceptions about COVID-19 among study participants could simply be due to low literacy; ~98% of participants were illiterate. The Rohingya people in Bangladesh have been traumatised by systemic violence and persecution in Myanmar, and they live in crowded camps with limited access to resources, technologies and information, which may facilitate the spread of incorrect information about COVID-19 in the camps, leading to misconceptions.<sup>14 16</sup>

Although prior studies have not focused on refugee and displaced populations, studies among general adults suggest that various misconceptions are very likely to persist during pandemic.<sup>30 31</sup> In line with our findings, previous studies have also documented misconceptions about spread through mosquitoes, prevention through nutrition, drinking water and the use of antibiotics, and severe outcomes among smokers.<sup>32–34</sup> Although the role of a healthy diet and hydration in promoting health and well-being is indisputable, there is no evidence that it directly prevents COVID-19. Among the refugee population where scarcity of safe water and nutritious food is paramount, their perceptions about these commodities' positive effects are understandable. Likewise, the deleterious impact of smoking on lung health is well established, and smokers are at increased risk of respiratory

**Table 2** COVID-19 misconceptions among the participants (n=416)

Misconceptions	N	%
<b>Misconception regarding spread</b>		
COVID-19 spreads through mosquito bites.	175	42.0
COVID-19 spreads through COVID-19 testing.	53	12.7
All returning migrants carry COVID-19.	96	23.0
COVID-19 is transmitted only to non-religious or less religious people.	131	31.4
COVID-19 is transmitted only to people who practice 'socially unacceptable activities'.	107	25.7
<b>Misconception regarding prevention</b>		
Drinking water can prevent COVID-19.	247	59.3
Nutritious food can prevent COVID-19.	260	62.5
Everyone should wear personal protective equipment when outdoors to prevent COVID-19.	352	84.6
COVID-19 patients do not have to quarantine.	44	10.5
We should not go to the funeral of people who died of COVID-19.	164	39.4
Smoking does not increase the risk of COVID-19.	164	39.4
<b>Misconception regarding treatment</b>		
Doctors can cure COVID-19.	87	20.9
Traditional healers can cure COVID-19.	1	0.2
Antibiotics can cure COVID-19.	11	2.6

illness. Although it may not influence the likelihood of infection with COVID-19, the emerging evidence suggests that smokers are more likely to develop severe COVID-19 than non-smokers.<sup>35</sup>

Two notable and highly prevalent misconceptions were related to the use of PPE by everyone when outdoors and transmission of infection by returnee migrants. In the beginning, when COVID-19 was limited to China, cases around the world were imported. One of the initial steps taken against COVID-19 by many countries worldwide, including Bangladesh, was to restrict international travel and quarantine travellers on arrival. Such activities were widely reported in the news media and closely paid attention and were the topics of conversation among general Bangladeshis because international migration is very high in Bangladesh, and there was a constant fear of importing the disease. In many instances, people even blamed migrants for bringing COVID-19 into Bangladesh.<sup>36</sup> So not just among Rohingya refugees, we anticipate the misconceptions that returning migrants carry COVID-19 to be widespread among Bangladeshi people. Another topic that has been even much more widespread in the news outlets is the shortage of essential resources and health services to manage the COVID-19. There are major resource constraints on the Bangladeshi health-care system, which were widely reported in the media during the pandemic. From the onset of this pandemic, the Bangladeshi government was blamed for shortages of PPE. The importance of PPE in protecting against the infection is indisputable. However, given the much-publicised shortages, it is possible that participants felt that they needed PPE to protect themselves (and not just the health professionals).

Misinformation is very likely to persist in FDMN camps where internet access is limited, and due to poor health literacy,<sup>37</sup> the population may not easily distinguish reliable sources of information and depend on less credible sources that promote misconceptions.<sup>38</sup> To provide accurate information to the FDMNs in camps, volunteers in Cox's Bazar disseminated COVID-19 related information door to door using bicycles and loudspeakers.<sup>39</sup> Despite these efforts, some misconceptions were highly prevalent among our study population. Two factors—the content of the information and trust in the source of information—may explain our findings. First, the information provided by the dissemination service, which included key COVID-19 information together with general mental health and psychosocial support information,<sup>39</sup> may not have included the information relevant to the misconceptions covered in our study. In fact, we were glad to note that only a few participants had misconceptions about the treatment of COVID-19, which could be due to these dissemination activities. In terms of prevention, the focus of these dissemination activities was on evidence-based preventive activities such as hand washing, wearing a mask, social distancing and may not have addressed the misconceptions captured in our study. Second, despite making such information available, it is unknown to what extent communities trusted such an external source of information. In times of public health emergencies, distrust of public health officials and their messages have previously been reported among the general population as well as among immigrants and minorities.<sup>40</sup> For refugee and displaced populations, their specific beliefs, past negative experiences of discrimination, immigration experience and previous encounters and experience with

**Table 3** Factors associated with misconceptions among the participants

Characteristics	$\beta$	P value	95% CI
<b>Sex</b>			
Male	Ref		
Female	-0.27	0.169	-0.66 to 0.12
<b>Dependent on the family for living</b>			
Yes	Ref		
No	0.30	0.150	-0.11 to 0.72
<b>Memory or concentration problems</b>			
No problem	Ref		
Low memory or concentration	0.88	0.002	0.31 to 1.44
<b>Pre-existing chronic conditions</b>			
No	Ref		
Yes	5.88	<0.001	2.68 to 12.93
<b>Radio/TV as the source of COVID-19 information</b>			
No	Ref		
Yes	-0.35	0.128	-0.80 to 0.10
<b>Health worker as the source of COVID-19 information</b>			
No	Ref		
Yes	0.53	0.044	0.01 to 1.04
<b>Friends/family/neighbours as the source of COVID-19 information</b>			
No	Ref		
Yes	-1.03	<0.001	-1.55 to -0.52
<b>Concerned about COVID-19</b>			
Hardly	Ref		
Sometimes/often	0.28	0.193	-0.14 to 0.70
<b>Overwhelmed by COVID-19</b>			
Hardly	Ref		
Sometimes/often	-0.96	<0.001	-1.46 to -0.46
<b>Frequency of communication during COVID-19</b>			
Same as previous	Ref		
Less than previous	3.19	<0.001	2.67 to 3.70
<b>Close friends or family members diagnosed with COVID-19</b>			
No	Ref		
Yes	-2.33	<0.001	-3.43 to -1.22

government or medical institutions may contribute to their trust/distrust.<sup>41</sup> The same could also explain our most surprising finding that misconceptions were more likely among those who had received COVID-19 information from health workers. In addition, it is also possible that in a resource-constrained healthcare system, healthcare providers themselves may have been inadequately informed and prepared to provide evidence-based information to local communities. When resources need to be prioritised, clinical health professionals are more likely to receive training and resources than frontline

community health workers.<sup>42</sup> So, the community health workers might not be well informed and updated about the evolving knowledge and may not have access to reliable information and training to disseminate positive and authentic information on COVID-19 to the community. If this is true, it highlights the importance of training local social/health workers to counter misconceptions related to COVID-19 among the older FDMNs.

We noted the importance of social networks among our study participants. Misconceptions were lower among those frequently communicating with friends and relatives, receiving COVID-19 information from them, or who had a close friend or family member diagnosed with COVID-19. Historically, Rohingya have a collectivist society with a strong sense of solidarity and mutual support.<sup>43</sup> Furthermore, the importance of social participation and networking increases with age,<sup>44</sup> so we believe that social networks are critically important for our participants. Specifically, for older Rohingya FDMNs, limited within the camp's physical boundaries and isolated from the global community due to inaccessible technology, younger family members may be an important source of information, both COVID-19 and non-COVID related. Learning from the first-hand experience of a close friend or family member diagnosed with COVID-19 may have been pivotal in reducing our participants' misconceptions. As a COVID-19 case, our participants' social network may have received valid information from humanitarian or health staff that they may have passed on to the community, thereby reducing the misconceptions. As the head of the household or as a close companion, some of our participants may even have had an opportunity to learn how to navigate the health system and use its resources. Thus, they may have gained reliable information to combat misinformation. Language is one of the greatest barriers to access health information among immigrants and refugees.<sup>45</sup> To overcome that barrier, it is common to train local community members and recruit them as a community health worker. Hence, during the survey, our participants may have identified those community health workers as their family members or relatives or friends and thus misclassified their information source.

Three in 10 participants had a prevalent non-communicable chronic condition and had higher COVID-19 misconceptions than those without it. Given that those with pre-existing conditions are at greater risk of severe illness and mortality,<sup>46</sup> it is plausible to assume that they are more likely to panic and strive to find more information about the disease. In an infodemic, rumours and misconceptions are more widespread than facts. Consequently, members of the public may be more susceptible to the spread of misinformation as they may accept any information related to COVID-19 without verifying the source's credibility. This finding is worrisome and has implications for their self-management and adherence to treatment for their chronic conditions as misconceptions preclude adherence to medical treatments and preventive measures. Hence, health workers

have added responsibilities to fight against misconceptions. Low literacy levels among the Rohingya community might have posed additional challenges to evaluate the information they receive from various sources.<sup>47</sup>

These misconceptions among older Rohingya adults have several implications for public health practice. First, misinformation may cause them to deviate from following public health recommendations. Given that our study participants are one of the most vulnerable population for severe COVID-19 outcomes, ignoring public health measures may lead to very unfavourable health outcomes. Second, in a collectivist society where the household head or the decision maker is the older family member, misconceptions and misinformation among household heads prevent younger family members from accessing healthcare. For example, they may prevent their daughters and daughters-in-law and grandchildren from seeking health services, including future immunisation programmes against the COVID-19. Third, the ongoing COVID-19 dissemination activities have an opportunity to expand their education to tackle locally prevalent myths specifically.

To the best of our knowledge, this is the first study that systematically explored the level of COVID-19 related misconceptions among the FDMN older adults in Bangladesh. However, the study has certain limitations. First, there is a possibility of selection bias as we conveniently selected a camp and purposively selected the participants from the selected camp in the absence of the listing of older adults. Second, the purposive sampling limits the generalisability of study findings to the entire camp population. Third, although we did a thorough literature review to identify probable misconceptions, yet there are possibilities that we might have missed some potential misconceptions or worded these in a way that may have biased responses (especially regarding the use of traditional medicine for COVID-19).

## CONCLUSION

Older Rohingya adults are a higher at-risk group for COVID-19 transmission, and their risk may be further exacerbated when misconceptions are prevalent. All the relevant organisations closely assisting the management of Rohingya FDMNs in Bangladesh, such as the Government, United National, bilateral agencies and humanitarian non-government organisations, need to prioritise getting more accurate information and educating older Rohingya FDMNs. Failure to provide appropriate information may worsen the spread and impact of the pandemic in the overcrowded camps. Health workers are key sources of health-related information for the refugees. As such, they should be provided with regular training to update their knowledge and decrease misconceptions. It is also very important to provide health literacy intervention as part of infodemic management to address the behaviour at all levels—individual, community, health-care and humanitarian workers.

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