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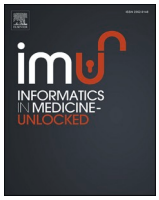

COVID-19 related knowledge sharing practice and associated factors among healthcare providers worked in COVID-19 treatment centers at teaching hospitals in Northwest Ethiopia: A cross-sectional study

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ABSTRACT

Background: COVID-19 is a pandemic that causes many deaths and disrupts the lives of the world population on an unprecedented scale. Healthcare providers are on the frontline in the struggle against this pandemic. In this regard, knowledge sharing is very crucial for healthcare professionals to provide safe, effective, and quality patient care during the COVID-19 pandemic. Accurate and timely COVID-19 related knowledge helps for making evidence-based decisions, during the management of the pandemic. Therefore, this study aimed to assess COVID-19 related knowledge sharing practices and associated factors among healthcare providers who worked in COVID-19 treatment centers at specialized teaching hospitals in the Amhara Regional State, Northwest Ethiopia.
Method: An institutional-based cross-sectional survey was conducted from April 1 to May 30, 2021. The study included 476 healthcare providers who worked in COVID-19 treatment centers at specialized teaching hospitals in Northwest Ethiopia. A pretested and structured self-administered questionnaire was used to collect data. EpiData 4.6 and SPSS version 23 were used for data entry and analysis respectively. Bi-variable and Multivariable logistic regression analysis was used to identify factors associated with the dependent variable. A *P*-value of less than 0.05 was used to declare statistical significance.
Result: A total of 454 respondents, with a response rate of 95.4%, were participated in the study. About, 55.3% (95% CI: 51–60.2) of healthcare providers had a good level of COVID-19 knowledge-sharing practice. Phone type [AOR = 4.05, 95% CI (1.99–8.25)], computer access [AOR = 2.09, 95% CI (1.12–3.92)], awareness [AOR = 2.01, 95% CI (1.20–3.39)], willingness [AOR = 1.77, 95% CI (1.05–2.97)] and educational status [AOR = 2.94, 95% CI (1.92–5.71)] were significantly associated with the COVID-19 knowledge sharing practices in the multivariable logistic regression model.
Conclusion: The finding implied that above half of the healthcare providers in this study setting were good at sharing their COVID-19 related knowledge. Policymakers, government, and other concerned bodies should stress to improve computer access, awareness creation, enhancing healthcare providers' willingness to share their COVID-19 related knowledge, introducing smartphone technology, and rising healthcare providers' educational status are necessary measures to improve COVID-19 related knowledge sharing practice in this study setting.

1. Background

Coronavirus (CoV) is a new respiratory virus known to cause diseases ranging from common cold to extreme acute respiratory syndrome (SARS) [1]. Fever, dry cough, weakness, myalgia, and shortness of breath are major clinical signs and symptoms of this pandemic e [2]. The coronavirus disease (COVID-19) causes many deaths and disrupts the lives of the world population on an unprecedented scale. The virus is characterized by a high rate of transmission, which makes the spread of the disease difficult to manage. At the end of September 2021, the pandemic had affected 233.503 million people in the world [3]. Even if its spread was slowly in Africa at the beginning of the pandemic, it

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became more aggressive with many more cases since the second year of the pandemic [4,5]. Globally, the virus has no effective treatment. However, currently, some vaccine products can reduce the transmission and severity of this pandemic [6,7].

Ethiopia registered the first case of COVID-19 in the second week of March 2020 which later becomes the fifth most affected country in African [8]. There have been 345,674 confirmed cases of COVID-19 with 5582 deaths according to recent reports at the end of September 2021 [9]. In Ethiopia, there is no adequate vaccine provided to the population, due to resource scarcity. This situation worsens the risk of illness, hospitalization, and death from the virus [6]. The federal government of Ethiopia and the regional states took several preventive measures to tackle the spread of the COVID-19 pandemic [10]. The most COVID-19 preventive measures that were taken include case identification, contact tracing, isolation, limit public gathering, travel restriction, enforcement of face mask mandates, and quarantine for exposed persons [6,11].

During the pandemic, knowledge sharing and exchanging of information is very crucial for healthcare professionals to provide safe, effective, and quality patient care [12,13]. In this regard, Ethiopia's government has been working to exchange information about COVID-19 prevention measures through television, radio, and social media [14,15]. Knowledge sharing is operationalized as sharing experiences, information, and skills among individuals [16]. In this regard, COVID-19-related knowledge sharing is a deliberate act of communication between healthcare providers (HCPs) to transmit knowledge about the pandemic within and across the healthcare organization. It enabled healthcare providers to retrieve and reuse knowledge about the COVID-19 pandemic. Additionally, COVID-19 related knowledge sharing improves group interaction, relationships, and performance to meet the needs of COVID-19 patients [17]. Effective knowledge sharing practice about COVID-19 has the potential to give healthcare organizations a continuous competitive advantage in evidence-based clinical decision-making. In such a manner, it plays a vital role in creating COVID-19 free populations [18].

Previous studies in Ethiopia were assessed COVID-19 knowledge. Those studies implied high variation in the level of healthcare providers' knowledge which ranged from 48.97% to 85.2% [17–23]. This substantial variation could be due to the difference in sample size and study setting between those previously conducted studies. Additionally, there might be a change in the level of COVID-19 knowledge during the different waves of the pandemic. However, COVID-19 related knowledge-sharing practice was limited in healthcare researches. Additionally, most of the existing literature on knowledge-sharing practice was not specific to COVID-19 [19–24]. Hence, we argue that a study that specifically assesses the knowledge-sharing practice of COVID-19 is critical for specific policy measures and interventions for this pandemic. Literature also confirmed that knowledge sharing is a key to tackling disinformation and management of disasters like that of the COVID-19 pandemic [25–27].

A study conducted in Malaysia showed a poor culture of knowledge sharing practice (32.8%) [28]. A study in Ireland implied that 56.3% of HCPs had encountered challenges for accessing information and experience from their mental health team [29]. A literature review in Ethiopia implied the health professionals' knowledge sharing practice was low and the results were varied from 33.4% to 89% [19–24]. Experience(13), educational level [21], willingness [19], awareness (23), availability of health information resources [30], teamwork [28], computer literacy [19], communication mechanism [28], and internet access [31] were major determinant factors for Knowledge sharing practice.

Healthcare workers in most health institutions are working simply by rehearsing their school learning without accessing knowledge from their colleagues. This creates so many problems for giving treatment for patients based on new evidence [32]. Having a good knowledge-sharing practice is vital and it creates better understanding and a sense of commitment among HCPs working in COVID-19 treatment centers. It helps to create effective networking among the various communications, procedures, norms, and values within the health organization (23). Therefore, this study aimed to assess COVID-19 related knowledge sharing practice and its associated factors among HCPs worked in COVID-19 treatment centers.

2. Methods

2.1. Study design, area, and period

An institutional-based cross-sectional survey was conducted among HCPs who worked in the COVID-19 treatment centers at specialized and teaching referral hospitals in the Amhara regional state. The study was conducted from April 1 to May 30, 2021. It was conducted at Tibebe-Gion and the University of Gondar specialized and teaching referral hospitals. Those hospitals are the only specialized and teaching hospitals in the Amhara region that are similar in terms of staff and the scope of the service provided.

Amhara region is located in the Northwestern and North Central parts of Ethiopia. It is among the nine regional states in Ethiopia. It has 85 hospitals (2 specialized and teaching referral hospitals, 6 referral hospitals, 20 general hospitals, and 67 primary hospitals), 862 health centers, and 10 private hospitals, based on 2021 Amhara regional health bureau reports. It has also more than ten coronavirus treatment centers such as Bahirdar, Gondar, Dessie, Debre-Berhan, Debre-Markos, Debretabor, Woldya, Metema, Finote-Selam, and Dangila. Among those treatment centers, only two are teaching specialized hospitals namely Bahirdar and Gondar.

2.2. Source and study populations

All healthcare providers who worked in COVID-19 treatment centers at specialized and teaching referral hospitals in the Amhara regional state namely Tibebe Gion and the University of Gonder specialized and teaching referral hospitals were the source population. Whereas, all healthcare providers who worked in COVID-19 treatment centers at Tibebe Gion and the University of Gonder specialized and teaching referral hospitals that were available during the data collection period were the study populations.

2.3. Inclusion and exclusion criteria

Healthcare providers in the two specialized teaching hospitals of the Amhara region who were involved in the treatment and follow-up of COVID-19 patients and who were voluntary participate were included in the study. Whereas, healthcare providers who were absent during the data collection period by any means were excluded from the study.

2.4. Sample size determination and sampling procedure

There were only two specialized teaching hospitals in the Amhara region. All specialized teaching hospitals in this region were approached. First: the sample size was calculated by using single population formula by considering the following assumptions:

Z = Standard normal deviation ($z_{(a/2)=}$ 1.96 for a 95% confidence level), n = the final sample size, p = the proportion of the population (p = 50%), and d = margin of error (d = 0.05).

$$n = (z_{a/2})^2 \frac{p(1-p)}{d^2} = (1.96)^2 \frac{0.5(1-0.5)}{0.05^2} = 384 \quad (1)$$

By summing up a non-response rate of 10%, we got a total sample size of 423. However, there wasn't much difference between the calculated sample size (423) and the total number of the study population (476). Accordingly, we conducted an institutional-based survey and every healthcare provider who worked in COVID-19 treatment centers of specialized teaching hospitals in the Amhara region was

approached. A list of healthcare providers who were involved in the treatment and follow-up of COVID-19 patients was obtained from the administrative body of each hospital.

2.5. Data collection tool and procedure

A pretested and structured self-administered questionnaire was used to collect the data. All necessary precautions for COVID-19 prevention were used during the data collection of the study. The tool was adapted from WHO knowledge management guidelines and previous studies that related to knowledge sharing practice of health issues [19,20,23,24,33–35]. Four data collectors (two medical laboratory professionals, one nurse professional, and one anesthesia professional) and two supervisors were participating in data collection.

A total of 69 item questioners within six parts such as socio-demographic characteristics, information source, individual characters, and channels for COVID-19 related knowledge-sharing, technological related questions, and COVID-19 related knowledge-sharing practice were used. Pretest was conducted among 24 healthcare providers (5% of the total sample size) at Debretabor hospital COVID-19 treatment center which was similar to our study setting. The correctness, consistency, and quality of the questionnaire were checked and seen in detail based on the pretest finding. The content validity of the questionnaire was determined based on the view of experts and the reliability was obtained by calculating the value of Cronbach alpha (overall Cronbach alpha for COVID-19 related knowledge sharing practice = 0.86).

2.6. Measurements

COVID-19 related knowledge sharing practice: Defined as the sharing of experience, information, relevant data, events, thoughts, skill, or understanding of coronavirus disease-related things. It was measured by twelve closed-ended Likert scale questions in which ratings were made on a one to five scale where; 1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, and 5 = always. Since COVID-19 related knowledge sharing practice was not normally distributed, we computed the median score. Respondents who scored with the median score and above were considered as they had good knowledge-sharing practice regarding COVID-19. The good knowledge-sharing practice was coded as "1" in the regression analysis. Whereas respondents who scored below the median score were considered as they had poor knowledge-sharing practice regarding COVID-19. Poor knowledge-sharing was coded as "0" in the regression analysis [20,23,24].

Awareness to share COVID-19 related knowledge: It was measured by four closed-ended Likert scales questions ranging from "1 = strongly disagree" to "5 = strongly agree". Accordingly, Respondents who scored the mean score and above were considered as they had good awareness about COVID-19 related knowledge sharing whereas those who scored below the mean score were considered as they had poor awareness about COVID-19 related knowledge sharing practice [19,36].

Job satisfaction: It was measured by five closed-ended Likert scales questions with response options ranging from "1 = strongly disagree to 5 = strongly agree". Respondents who scored the mean score and above were considered as satisfied with his/her job of coronavirus disease treatment and those who scored the value below the mean score were considered as dissatisfied with his/her job of coronavirus disease treatment [19].

Intrinsic motivation to share COVID-19 related knowledge: Indicates the pleasure and inherent satisfaction derived from a specific activity like enjoying by sharing their knowledge to others. It was measured by two closed-ended questions with a Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree". Respondents who scored mean and above were considered as they had good intrinsic motivation to share knowledge about coronavirus disease whereas respondents who scored below the mean score were considered as they had poor intrinsic motivation to share knowledge about coronavirus disease [36].

Extrinsic motivation to share COVID-19 related knowledge: It was measured by two close-ended questions with a Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree". Respondents who scored the mean score and above were considered as they had the good extrinsic motivation to share knowledge about coronavirus disease and those who scored below the mean were considered as they had the poor extrinsic motivation to share knowledge about coronavirus disease [37].

Willingness to share COVID-19 related knowledge: It was measured by three closed-ended Likert scales questions ranging from "1 = strongly disagree" to "5 = strongly agree". Accordingly, respondents who scored mean and above were considered as they had the willingness to share COVID-19 knowledge. Whereas respondents who scored below the mean score were considered as they hadn't a willingness to share COVID-19 related knowledge with their colleagues [19,28].

Computer Literacy: It was measured by five closed-ended questions with the response option yes/no. Respondents who scored median and above were considered as they had good computer literacy and those who scored below the median score were considered as they had poor computer literacy [20,23,38].

Leadership support**:** It is the necessary support provided by senior managers, which was measured with four-item Likert scale questions ranging from "1 = strongly disagree to 5 = strongly agree". Respondents who scored the mean score and above were considered as they had good leadership support and those who scored below the mean score were considered as they had poor leadership support [39,40].

Computer access: In this study computer access refers to the availability of computers at the working unit, home, and others which was measured by yes or no question. First, the respondents were asked if they accessed the computer. Then, if they responded "yes" to the availability of the computer, they were asked where they got a computer. Similar techniques were used for measuring internet access [19,28] (**Additional file 1**).

2.7. Data processing and analysis

First, data were coded and cleaned for completeness and consistency. Then, the data were entered by EpiData version 4.6 and exported to SPSS 23 for further analysis. Summary statistics of socio-demographic variables were presented using frequency tables. Bi-variable logistic regression analysis was computed to control confounding. All independent variables with *P*-value less than 0.2 in Bi-variable logistic regression were entered into multivariable logistic regression analysis. The strength of the association was described at 95% CI and the level of significance was determined at a *P*-value of less than 0.05 for multivariable regression analysis model.

The fitness of the model was checked by using Hosmer and Lemeshow test (χ 2/df = 4.81; RMSEA = 0.05; CFI = 0.95; TLI = 0.93). A multi-collinearity test was conducted among the independent variables and all of the variables scored variance inflation factors (VIF) of between 1.0 and 1.7. Most researchers considered a VIF>10 an indicator of multicollinearity [41]. Accordingly, our result showed that no correlation or moderate correlation between independent variables.

3. Results

3.1. Socio-demographic characteristics

From a total of 476 healthcare providers, 454 with a response rate of 95.4% were included in this study. The reason for the non-response rate was due to annual leave and the illness of healthcare providers during the data collection period. Based on the demographic information obtained, 336(74.0%) of respondents were male. Half of the respondents 227(50.0%) were categorized under the age group of 21–30 years with the mean age of 28.53 ± 5.6 years.

The majority of the respondents 351(77.3%) were first-degree holders. One hundred seventy-nine (39.4%) of respondents were clinical nurses. On the other hand, the majority of the respondents 392 (86.3%) were smartphone holders. Three hundred ninety-eight (87.7%) of the respondents were social media account users. The majority of the respondents 327(72.0%) had two months experience of working in the COVID-19 treatment center(Table 1).

3.2. Individual characteristics

Of the total respondents, 266(58.6%) had good awareness to share COVID-19 related knowledge. More than half of the respondents 254 (57.5%) were satisfied with their jobs to share COVID-19 related knowledge. The majority of the respondents 303(66.7%) were willing to share COVID-19 related knowledge. More than half of the respondents 234 (51.5%) had good extrinsic motivation.

3.3. Organizational characteristics

Of the total respondents, 232(51.1%) had the good extrinsic motivation to share COVID-19 related knowledge. More than half of the respondents 254(55.9%) had supportive leadership and 347(76.4%) of the respondents had internet access. Three hundred sixteen (69.6%) of the respondents had computer access and 165(36.3%) of respondents had not got computer training.

Table 1
Socio-demographic characteristics of healthcare providers working at COVID-19 treatment centers in Amhara region, North Ethiopia, 2021.

Variables (n = 454)	Frequency (n)	Percentage (%)
Sex		
Male	336	74.0
Female	118	26.0
Age category in years		
21-30	227	50.0
31-40	181	39.9
41-50	46	10.1
Educational status		
Diploma	4	0.9
BSc degree	351	77.3
Masters and above	99	21.8
Marital status		
Single	253	55.7
Married	178	39.2
Divorced	23	5.1
Religion		
Christian orthodox	336	74.0
Muslim	57	12.6
Protestant	60	13.2
Others	1	0.2
Profession of the respondent		
Medical doctor	85	18.7
Nurse	179	39.4
Medical laboratory	91	20.0
Midwifery	25	5.5
Anesthesia	11	2.4
Pharmacy	57	12.6
Radiology	6	1.3
Experience at the COVID-19 treatment center		
One month and below	88	19.4
Two month	327	72.0
Three months and above	39	8.6
COVID-19 history		
No	411	90.5
Yes	43	9.5
Types of mobile phone		
Smart	392	86.3
Basic	62	13.7
Social media account		
No	56	12.3
Yes	398	87.7

3.4. Factors associated with knowledge sharing practice

A total of 24 variables were entered into the binary logistic regression model. From those variables: age, sex, educational status, professions, mobile phone types, computer access, internet access, awareness, willingness, intrinsic motivation, computer literacy, and extrinsic motivation were factors associated with COVID-19 related knowledge sharing practice in the bi-variable regression analysis at *P*-value less than 0.2. Consequently, those variables were subjected to the multivariable logistic regression analysis to control the potential confounders.

In the multivariate logistic regression analysis, respondents who had smartphone mobile [AOR = 4.05, 95% CI (1.99–8.25)], respondents who had computer access [AOR = 2.09, 95% CI (1.12–3.92)], respondents who had good awareness to share COVID-19 related knowledge [AOR = 2.01, 95% CI(1.20–3.39)], respondents who were willing to COVID-19 related knowledge sharing [AOR = 1.77, 95% CI (1.05–2.97)], respondents who were master holders and above [AOR = 2.94, 95% CI(1.92–5.71)] were significantly associated with COVID-19 related knowledge sharing practice at *P*-value less than 0.05(Table 2).

4. Discussion

The present study examined COVID-19 related knowledge sharing practice and determining factors in treatment centers of resource-limited settings. Knowledge sharing is a significant part of knowledge management strategy which means the exchange of employees' knowledge, skills, and experience [27,42,43]. The result of this study showed that out of 454 study participants 251(55.3%) (95% CI: 51–60.2) of healthcare providers who worked in COVID-19 treatment centers were at a good level in sharing their COVID-19 related knowledge.

This finding was in line with the study conducted in Addis Ababa, Ethiopia (53%) [37] and the study conducted in Malaysia (57.2%) [28]. The finding was slightly higher than the study conducted in different parts of Ethiopia such as: in Addis Ababa (49.0%) [19], Mekelle (49.18%) [20], Gonji Kolella District (41.9%) [24], Bahirdar (19%) [21] and the study in Assosa (11%) [22]. The possible justification for this variation could be the current study conducted specifically on the COVID-19 pandemic. As a result, the presence of coronavirus disease, the severity of disease, the speed of disease transmission, and the lack of effective treatment for the disease could be the reason for this variation.

The other possible justification could be technological increment, high computer access, and internet access within the time gap of those studies. Additionally, the variation of awareness, willingness, educational status, and smartphone access of the respondent could be the justification to increase COVID-19 related knowledge sharing practice among HCPs worked in coronavirus treatment centers in the Amhara region specialized and teaching referral hospitals.

However, the finding of this study was less than the study conducted in the north Showa zone of Ethiopia (66.6%) [23]. This variation could be the difference in the study area and sample size. In this regard, the previous researcher in the North Shewa zone has conducted only among 284 respondents; but this study was conducted among 454 respondents. This finding was also less than the study conducted in Jordan hospitals (73%) [44]. This variation might be due to the differences in the level of experience, educational system, infrastructure, management system, and the difference in the culture of individual healthcare providers between different countries. In addition, this might be due to the difference in the integration of knowledge management, communication, and flow of knowledge in the organization, and internet penetration of the country [44].

According to the result from multi-variable regression analysis, the odds of respondents who had good awareness about COVID-19 related knowledge-sharing practice were 2.01 times more likely to share their COVID-19 related knowledge than that of respondents who had poor

Table 2
Factors associated with COVID-19 related knowledge sharing practice among healthcare providers working at COVID-19 treatment centers in Amhara region, north Ethiopia, 2021.

Variables	COVID-19 Knowledge Sharing Practice		COR(95%CI)	AOR (95%)
	Good	Poor		
Age category in years				
21-30	117 (25.8%)	110 (24.2%)	0.51 (0.27–1.49)	0.32 (0.26–1.01)
31-40	103 (22.8%)	78 (17.2%)	0.64 (0.34–1.82)	0.51 (0.32–1.27)
41-50	31(6.7%)	15(3.3%)	1	1
Sex				
Male	198 (43.6%)	138 (30.4%)	1.76 (1.15–2.69)	1.39 (0.94–2.29)
Female	53 (11.7%)	65 (14.3%)	1	1
Educational status				
BSc degree and below	170 (37.4%)	185 (40.8%)	1	1
Masters and above	81 (17.8%)	18(4.0%)	4.90 (2.82–8.50)	2.94 (1.92–5.71)*
Profession of the respondent				
Medical doctor	59 (13.0%)	26(5.7%)	1	1
Nurse	95 (20.9%)	84 (18.5%)	0.50 (0.29–0.86)	1.30 (0.67–2.50)
Laboratory	53 (11.6%)	38(8.4%)	0.62 (0.33–1.14)	1.13 (0.54–2.57)
Pharmacy	27(6.0%)	30(6.6%)	0.40 (0.20–0.80)	1.23 (0.54–2.83)
Others	17(3.8%)	25(5.5%)	0.30 (0.14–0.65)	0.50 (0.20–1.23)
Types of mobile phone				
Smartphone	236 (52.2%)	156 (34.4%)	4.74 (2.56–8.77)	4.05 (1.99–8.25)*
Basic phone	15(3.1%)	47 (10.3%)	1	1
Computer access				
Yes	200 (44.1%)	116 (25.5%)	2.94 (1.65–3.82)	2.09 (1.12–3.92)*
No	51 (11.2%)	87 (19.2%)	1	1
Internet access				
Yes	212 (46.0%)	135 (30.4%)	2.74 (1.31–3.31)	1.24 (0.63–2.46)
No	39(8.6%)	68 (15.0%)	1	1
Awareness				
Good	174 (38.3%)	92 (20.3%)	2.73 (1.86–4.01)	2.01 (1.20–3.39)*
Poor	77 (17.0%)	111 (24.4%)	1	1
Intrinsic motivation				
Good	146 (32.1%)	88 (19.4%)	1.82 (1.25–2.64)	1.14 (0.70–1.85)
Poor	105 (23.1%)	115 (25.4%)	1	1
Willingness				
Yes	196 (43.1%)	107 (23.6%)	3.20 (2.13–4.80)	1.77 (1.05–2.97)*
No	55 (12.1%)	96 (21.2%)	1	1
ICT Literacy				
Good	175 (38.5%)	118 (26.0%)	1.66 (1.13–2.44)	0.77 (0.47–1.27)
Poor	76 (16.8%)	85 (18.7%)	1	1
Extrinsic motivation				
Good	142 (31.3%)	90 (19.8%)	1.64 (1.13–2.38)	1.16 (0.74–1.81)
Poor	109 (24.0%)	113 (24.9%)	1	1

* Variable significant at *P*-value less than 0.05, 1 = reference.

awareness. This implied that an increase in the awareness of COVID-19 related knowledge-sharing practice among respondents increases the real practice to share COVID-19 related knowledge. This finding was consistent with the study conducted at Felege Hiwot referral hospital [21]. Furthermore, the finding was supported by the research conducted at the Addis Ababa health bureau, which stated that respondents who were more aware of experiences and knowledge sharing practice were more likely to participate in the experience and knowledge sharing practice [19].

The odds of respondents who were willing about COVID-19 related knowledge sharing were 1.77 times more likely in practice to share their COVID-19 related knowledge to their staff and colleagues than counterparts. This showed that increasing the respondent's willingness could increase participation in COVID-19 related knowledge-sharing practice. This result was corresponding with a study conducted at Felege Hiwot referral hospital [21].

The odds of respondents who had computer access were 2.09 times more likely to share COVID-19 related knowledge than that of the respondents who hadn't computer access. The finding was supported by a study conducted in Malaysia [28]. This showed that computer access increases COVID-19 related knowledge-sharing practice. This is due to anyone who had computer access, could create social media account and install any important applications which help to share COVID-19 related knowledge. As a result, they simply share their COVID-19 related knowledge's with their staff and colleagues. The finding was consistent with the study conducted at Addis Ababa [19], Gonji Kolella District health facility [24], and North Showa [23].

However, a related study conducted at Mekelle showed that technological factors have no significant association with knowledge sharing practice [20]. This variation could be due to organizational systems, infrastructural differences, and study time. Additionally, the existence of the COVID-19 pandemic during the study period of this study might enforce the healthcare providers to use technology for sharing their knowledge. Since there was a restriction of public gatherings, healthcare providers might use technology rather than face-to-face discussion.

The odds of respondents who were masters and above holders were 2.94 times more likely to share their COVID-19 related knowledge than that of respondents who were BSc and below. This showed that the increments of the level of education increase respondents' participation to share COVID-19 related knowledge. When the levels of educational status increase, awareness, and knowledge about COVID-19 related knowledge-sharing practices also increase. Due to this respondents could easily participate in COVID-19 related knowledge-sharing practices. This finding was supported by the study conducted at Bahirdar Felege Hiwot referral hospital [21].

The odds of respondents who had smartphone access were 4.05 times more likely to share their COVID-19 related knowledge than that of the respondents who had basic phone holders. This indicated that when the smartphone holder increases the respondent participation for COVID-19 related knowledge sharing practice also increases. Strengthening this finding literature noted that the smartphone is an effective and convenient mobile technology in exchanging information, which could foster social connection and well-being during the pandemic [45,46]. This could be due to if respondents have smartphones they could simply use important applications that help to share their knowledge regarding COVID-19. The other possible justification for this finding could be the availability of smartphones could enable to use of social media platforms. In this regard, if any individual has social media account, he/she simply access COVID-19 related knowledge from different sources and easily share that knowledge with their staff.

5. Conclusion

The finding implied that above half of healthcare providers in this study setting were good at sharing their COVID-19 related knowledge. Policymakers, government, and other concerned bodies should stress to

improve computer access, awareness creation about the importance and applicability of knowledge sharing, improve-healthcare providers' desire to enhance willingness, introducing smartphone technology, and rising healthcare providers' educational status to improve COVID-19 related knowledge sharing practice in this study setting.

Strengths and limitations of the study

This study was the first study in Ethiopia assessing knowledge sharing practice specifically on COVID-19. However, a comparison of the result was made with limited research due to no studies being found specifically on COVOID-19. Additionally, it is difficult to know about the precedence of the problem in detail since the study was cross-sectional. The major limitation of the study was that it didn't support qualitative findings. Moreover, the study was conducted only at the specialized teaching hospitals that might lower the generalizability of the findings to other treatment centers found in different types of hospitals. Therefore, a multicenter study supported with qualitative findings was recommended for feature researchers.

Authors' contributions

AAC, KD, and BT made significant contributions in the conception, design, data collection, supervision, data curation, investigation, data analysis, interpretation, and write-up of the manuscript. AF, BF, and HSN have contributed to developing the proposal, validation, revising the manuscript, preparing figures, analysis, visualization, and interpretation of data as well. Finally, all authors (AAC, KD, AF, BT, BF, and HSN) reviewed and approved the final manuscript.

Research ethics approval: Human participants

Ethical clearance was obtained from the ethical review board of the University of Gondar College of Medicine and Health Science with ethical reference number: IPH/1476/013. Informed consent was obtained from each study participant after they were informed of the objective and benefits of the study. To keep the confidentiality of information provided by the study subjects, the data collection procedure was anonymous. Additionally, this study was conducted with the declaration of Helsinki.

Consent for publication

Not applicable.

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Data availability

The data will be available upon request from the corresponding author.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Abbreviations

AOR	Adjusted Odds Ratio
CFI	Comparative Fit Index
CI	Confidence Intervals
COR	Crude Odds Ratio
DEFF	Design Effect
FMOH	Federal Ministry of Health
RMSEA	Root Mean Square Error of Approximation
SPSS	Statistical Package for Social Science
TLI	Tucker-Lewis Index
VIF	Variance Inflation Factor
WHO	World Health Organization
WHZ	Weight-for-height z-scores.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.imu.2022.100856.

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