Misconceptions and associated factors of COVID-19 infection among internally displaced persons in Sudan

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Abstract

Coronavirus disease 2019 (COVID-19) is a global public health threat that has spread rapidly and caused morbidity and mortality worldwide.1-3 It emerged in late 2019 in Wuhan, Hubei province, China. The World Health Organization (WHO) officially declared a pandemic in March 11, 2020. Approximately 46 million COVID-19 cases and 1.2 million deaths have been reported globally.4,5 In Sudan, the first COVID-19 case reported by the Federal Ministry of Health was in March 13, 2020. A 50-years-old man entered Sudan from the United Arab Emirates, after which new infection of the virus in Sudan started to increase.6 Coronaviruses belong to a broad family of viruses that cause respiratory disease in humans, ranging from the mild common cold to fatal pneumonia.7,8 COVID-19 is an infectious respiratory disease that enters the human body via the eyes, nose, and mouth and spreads by droplets from coughs and sneezes, close contact with an infected person, and touching contaminated surfaces.9

The common symptoms of COVID-19 include high temperature, dry coughing, shortness of breath, fatigue, diarrhea, headache, loss of smell and taste, and complicated acute respiratory disease leading to pneumonia, renal failure, coma, and death.10-12 The risk factors of the severity of the illness include comorbid disorders such as diabetes mellitus, high blood pressure, cardiovascular disease, and chronic lung and kidney disease. Most people who contract the disease require hospital admission and invasive mechanical ventilation in an intensive care unit.13 To date, there is no definite cure available for COVID-19.14 The only recommended measures to pre-

Introduction

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The common symptoms of COVID-19 include high temperature, dry coughing, shortness of breath, fatigue, diarrhea, headache, loss of smell and taste, and complicated acute respiratory disease leading to pneumonia, renal failure, coma, and death.10-12 The risk factors of the severity of the illness include comorbid disorders such as diabetes mellitus, high blood pressure, cardiovascular disease, and chronic lung and kidney disease. Most people who contract the disease require hospital admission and invasive mechanical ventilation in an intensive care unit.13 To date, there is no definite cure available for COVID-19.14 The only recommended measures to pre-
vent the spread of COVID-19 infection involve hand hygiene, covering the mouth and nose when coughing or sneezing, and avoiding close contact with any person with symptoms of respiratory disease.\textsuperscript{15}

Myths commonly reflect folklore-type stories that play a vital role in human lives. Myths related to infectious diseases have spread through social media platforms and can take a long to dispel. Moreover, these myths can be dangerous to public health and reduce work efficacy against infectious diseases. The WHO has listed common myths and debunked them with accurate information about COVID-19 infection to increase public awareness.\textsuperscript{16} Reducing the myths about infectious diseases was vital for controlling transmission. A study conducted in Ghana reported that most participants possessed much misinformation related to the COVID-19 pandemic.\textsuperscript{17} Another study carried out in South Africa showed false information and misconception related to COVID-19.\textsuperscript{18}

Similarly, another study investigated misconceptions, myths, and beliefs related to the pandemic. The results showed that participants had misconceptions about the virus. They believed that it affects only the elderly, mosquito bites can spread the virus, antibiotics are effective treatments, and homemade remedies can cure the disease.\textsuperscript{19} A study in Ethiopia revealed that regional townships showed significant variations in myths, false assurances, and information requirements.\textsuperscript{20}

According to the United Nations, Internally Displaced Persons (IDPs) are the groups of persons who leave their homes by force due to armed conflict and have not crossed a border of the home country.\textsuperscript{21} Globally displaced people and refugees live in highly populated camps that lack basic sanitation, social distancing, and hand washing or maintaining personal hygiene, making them at the most incredible significant risk of COVID-19 infection.\textsuperscript{22} Darfur is the western region in the Sudan where the conflict broke out in 2003. However, the war peaked in 2004, which has ended over 300,000 lives, left around 3 million war victims, and crossed a border of the home country.\textsuperscript{21} The Darfur region is in Western Sudan and covers approximately 493,180 km\textsuperscript{2}. It compromises the states of North, West, South, East, and Central Darfur. The area has a population of nearly six million. Approximately 140,000, however, are IDP, about 60\% of whom are children living in camps due to war.\textsuperscript{24} The town of Zalingei is in the center of Darfur and is surrounded by three camps of IDP, Hesahesa, Al Hameda, and Teyba, as the result of war.\textsuperscript{25} The study was carried out from April to May 2020 in two camps around Zalingei: Hesahesa and Al Hamedia-Camp.

Study subjects
The study involved IDPs who resided in the camps.

Included criteria
We included IDPs who were available and willing to take part in the study. Exclusion criteria
We excluded IDPs who were not present in the data-gathering period and those who disagreed with the survey.

Sampling technique and size
Using the convenience sampling method, we collected the data manually by a self-administered questionnaire after explaining the purpose of the study and maintaining protective measures of COVID-19, such as maintaining social distance and wearing a face mask during data collection. We trained two data collectors to assist in the questionnaire administration and in receiving the responses. A total of 131 eligible participants completed the questionnaires in the survey.

Study variables

Independent variable
The independent variables were various sociodemographic characteristics of the respondents: gender, age, educational level, previous disease, and source of information.

Dependent variable
The dependent variable was a misconception about COVID-19.

Instrument of data collection
The self-administered questionnaire of this study aimed to assess the level of misconception toward COVID-19 prevention. The authors developed this questionnaire after critically reviewing the literature and WHO guidelines that listed the most common myths and clarified them with accurate information about COVID-19 infection to raise public awareness.\textsuperscript{22,26-29} We discussed the contents relevant with experts for the validity and tested the reliability of this instrument after making modifications according to the experts’ feedback. We then used the validated questionnaire in the pilot test involving 15 randomly selected respondents. The purpose of the pilot test was to estimate the time required to complete the questionnaire and ensure that every participant understood the questions. We excluded those who took part in the pilot study from the main study. The result of the reliability test computed by Cronbach’s alpha was 0.82, which showed acceptability.

The instrument consisted of two sections. In the first section, five demographic characteristics included: gender, age, education level, previous disease, and source of information. The second section comprised ten questions to measure the level of misconception about the transmission, prevention, and treatment of COVID-19. Each question had five options based on a 5-point Likert-type scale: strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points), and strongly disagree (1 point).

Data analysis
We analyzed the data using the Statistical Package for Social Sciences version 25. We performed specific statistical tests according to the research objective. We adopted descriptive statistics to describe the sociodemographic variables as frequencies, percentages, mean and standard deviation. However, in the inferential statistics, we run multiple linear regression to explore the dependent variable’s associated factors (independent variables). We fixed the significance level at <0.05 for all analyses.

Results

Demographic characteristics
A total of 131 respondents completed the survey questionnaire. As shown in Table 1, most (69, 52.7\%) of the respondents were female; 46 (35.1\%) were 50–60 years old; more than half (77, 58.8\%) were non-graduates; most (114, 87\%) did not have a comorbid disease; and nearly half (55, 42\%) had heard about COVID-19 from their families and friends.
Assessing the level of misconception of COVID-19

To the question of whether COVID-19 could only spread in cold areas, most (65.7%) of the participants responded neutrally. More than half (52.4%) were neutral about whether cold weather and snow could kill the virus, and 52.4% reported believing that regular washing with saline solution helps prevent COVID-19 infection. Nearly half (40.6%) of the participants responded neutrally to the idea that bathing with hot water prevents COVID-19; 45.5% believed falsely that mosquito bites could transmit the disease; 42.7% misbelieved that spraying the body with alcohol or chlorine helps eliminate the virus, and 45.5% believed falsely that regular washing with saline solution helps prevent infection. More than a quarter of respondents (28.7%) strongly agreed that eating garlic helps prevent the disease. The total mean score of the respondents’ misconception was 3.1725 (SD=0.59), with a percentage of 63.2% (3.16/ 5×100), which indicates a moderate level of misinformation toward COVID-19 (Table 2).

Factors associated with misconception of COVID-19

To determine the factors affecting misconceptions of COVID-19, we performed multiple regression analyses. All categorical variables were transformed into dummy variables coded between 1 and 0, converted to dichotomous variables, and treated as continuous variables. Then we included the k−1 dummy variables method in the regression equation, where k stands for the total number of categories, whether the variable is ordinal or nominal. The category that we removed from the equation is called the reference category. All the parameters of the dummy variables included denoting the difference or deviation from this reference category. The coded dummy variables (1 or 0) entered into the regression model as independent variables included gender, age, educational level, and source of information. These independent variables have subcategories as gender variable was dummy coded, the female became the reference category (female=0; male=1). For age groups were dummy coded variable and the last age group belonged to 50–60 years was selected as the reference group. Furthermore, we used people with no formal education as the reference group, and other education levels (i.e., primary, secondary, and graduate) were dummy coded and compared to the reference.

The results of the multiple regression analysis revealed that all the independent variables collectively have a significant impact on misconception according to the ANOVA statistics, F(4,116)=2.429, p<0.005. The regression model with all five predictors explains 22.7% of the variance in misconception. The results for the unique independent variable showed that participants aged 31–40 years had significantly higher levels of misconceptions, 381 (t=2.116, p<0.037), than those aged over 60 years, while controlling for the influence of the other predictors in the model (gender, different age groups, education, and source of information). Similarly, graduates had significantly lower levels of misconception −0.061 (t=−2.091, p<0.03) than uneducated.

Table 1. Distribution of demographic characteristics of the participants (N=131).

| Variable                        | N (%) |
|---------------------------------|-------|
| Gender                          |       |
| Male                            | 62 (47.3) |
| Female                          | 69 (52.7) |
| Age                             |       |
| <20                             | 6 (4.6) |
| 21–30                           | 19 (14.5) |
| 31–40                           | 18 (13.7) |
| 50–60                           | 46 (35.3) |
| <60 years                       | 42 (32.1) |
| Education level                 |       |
| Uneducated                      | 77 (58.8) |
| Primary                         | 34 (26.0) |
| Secondary                       | 14 (10.7) |
| Graduate                        | 6 (4.6) |
| Do you have a comorbidity disease like asthma, diabetes, heart disease? |       |
| Yes                             | 17 (13.0) |
| No                              | 114 (87.0) |
| Source of information           |       |
| Radio                           | 23 (17.6) |
| Television                      | 7 (5.3) |
| Health workers                  | 13 (9.9) |
| Humanitarian AIDS workers       | 7 (5.3) |
| Relatives and friends           | 55 (42.0) |
| Mosque                          | 20 (15.3) |
| Social Media, Facebook, WhatsApp | 6 (4.6) |

Table 2. Frequency distribution of misconception responses towards COVID-19 (n=131).

| Misconception scale 10-items                                      | Strongly agree, N (%) | Agree, N (%) | Neutral, N (%) | Disagree, N (%) | Strongly Disagree |
|-------------------------------------------------------------------|-----------------------|--------------|----------------|----------------|------------------|
| Does the Coronavirus spread only in cold areas?                   | 4 (3.1)               | 22 (16.8)    | 90 (68.7)      | 15 (11.5)      | 0 (0.0)          |
| Can cold weather and snow kill the new Coronavirus?              | 4 (3.1)               | 24 (18.3)    | 73 (55.7)      | 23 (17.6)      | 7 (5.3)          |
| Would hot bathing prevent the new Coronavirus?                    | 8 (6.1)               | 50 (38.2)    | 53 (40.5)      | 14 (10.7)      | 6 (4.6)          |
| Can the Coronavirus spread via mosquito bites?                    | 6 (4.6)               | 23 (17.6)    | 63 (48.1)      | 23 (17.6)      | 16 (12.2)        |
| Spraying your body with alcohol or chlorine will help eliminate the new Coronavirus? | 9 (6.9)               | 40 (30.5)    | 58 (45.0)      | 15 (11.5)      | 8 (6.1)          |
| Do you think vaccines for anti-pneumonia will protect against the new Coronavirus? | 6 (4.6)               | 25 (19.1)    | 68 (52.7)      | 25 (19.1)      | 6 (4.6)          |
| Regularly washing with saline solution may prevent Coronavirus infection? | 8 (6.1)               | 43 (32.8)    | 62 (47.3)      | 11 (8.4)       | 7 (5.3)          |
| Eating garlic helps prevent infection of Coronavirus?            | 41 (31.3)             | 33 (25.2)    | 30 (22.9)      | 19 (14.5)      | 8 (6.1)          |
| Applying sesame oil on your skin may prevent penetrating from the Coronavirus? | 34 (26.0)             | 26 (19.8)    | 36 (27.5)      | 26 (19.8)      | 9 (6.9)          |
| Are young people not infected with the Coronavirus?             | 17 (13.0)             | 25 (19.1)    | 46 (35.1)      | 32 (24.4)      | 11 (8.4)         |
| Total mean score of misconception                                | 3.1725 (SD=±0.59)     |              | 63.45          |               |                  |

Note: mean score range = 1-5, Std. Dev= Standard Deviation.
Table 3. Factors associated with the misconception of IDPs toward COVID-19.

| Predictors                          | B     | Std. Error | Beta | t     | p     |
|-------------------------------------|-------|------------|------|-------|-------|
| Gender                              |       |            |      |       |       |
| Constant                            | 2.995 | 0.333      | 9.002| 0.000 |       |
| Gender                              |       |            |      |       |       |
| Female (Ref)                        | 0.009 | 0.118      | 0.008| 0.078 | 0.938 |
| Male                                | 0.009 | 0.118      | 0.008| 0.078 | 0.938 |
| Age                                 |       |            |      |       |       |
| <60 years (Ref)                     |       |            |      |       |       |
| 20 years                            | 0.085 | 0.326      | 0.030| 0.261 | 0.794 |
| 21-30 years                         | -0.015| 0.223      | -0.009| -0.068| 0.946 |
| 31-40 years                         | 0.361 | 0.180      | 0.222| 2.116 | 0.057 |
| 50-60 years                         | 0.124 | 0.130      | 0.100| 0.959 | 0.344 |
| Education level                     |       |            |      |       |       |
| No formal education (Ref)           |       |            |      |       |       |
| Primary                             | -0.212| 0.158      | -0.157| -1.340| 0.183 |
| Secondary                           | -0.240| 0.246      | -0.126| -0.978| 0.330 |
| Graduate                            | -1.172| 0.288      | -0.415| -4.075| 0.000 |
| Source of information               |       |            |      |       |       |
| Relatives and friends (Ref)         |       |            |      |       |       |
| Radio                               | 0.245 | 0.157      | 0.158| 1.563 | 0.121 |
| Television                          | 0.434 | 0.266      | 0.165| 1.632 | 0.105 |
| health workers                      | -0.051| 0.221      | -0.026| -0.233| 0.816 |
| Humanitarian aids workers           | 0.209 | 0.253      | 0.080| 0.827 | 0.410 |
| Mosque                              | 0.140 | 0.159      | 0.085| 0.882 | 0.380 |
| Social Media (Facebook, what’s up)  | -0.122| 0.308      | -0.043| -0.397| 0.692 |
| R2                                  | 0.227 |            |      |       |       |
| F(14,16)                            | 2.429 |            | 0.005*|

Note: Ref= reference, a. Dependent Variable: overall mean score of misconception, *p<0.05.

Discussion

COVID-19 is a global public health threat that has spread rapidly and caused morbidity and mortality worldwide. Since the WHO has listed common myths to increase public awareness about COVID-19 infection. Disease-related myths are dangerous to public health and diminish the effect of work against infectious diseases. Reducing the myths about the contagious virus is vital for controlling transmission. This study investigated the level of misconceptions and associated factors of COVID-19 infection among IDPs in Sudan. The results showed that most respondents acquired information about COVID-19 from their relatives and friends. These findings could be due to a lack of sources such as television, radio, social media, and other internet services in conflict areas. These findings are consistent with a study conducted in the Democratic Republic of the Congo that showed that IDPs have less access to information through media and the internet than the comparison group. Another study indicated that even employment status influences some misconceptions about COVID-19 infection. The present study revealed that the total mean score of the respondents indicated a moderate misconception of COVID-19. These results may be because most people in rural areas still get their information from unofficial sources. These results are consistent with a study conducted by Schmidt et al. (2020) that revealed that false information spread on social media and stigmatized people’s responses to COVID-19. The WHO has posted correct information on its official site to advise the public to fight against myth-busters toward COVID-19. The public should be encouraged to understand myths and facts related to the condition. The multiple linear regression analysis revealed a significant association between misconception and demographic variables. The results of this study are consistent with a survey that showed a significant association between myths and lower levels of education, older people, and women. Furthermore, participants aged 31–40 years had significantly higher levels of a misconception than those over 60 years, and graduates had considerably lower levels of misbelief than non-graduates, which indicates that every increase in education level reduces the effect of misinformation and vice versa. We suggest an urgent education campaign focusing on IDP with lower levels of education to correct misinformation and increase their awareness of COVID-19 infection through official social media channels.

Strengths and limitations

This study has some limitations. Firstly, we conducted this work in the central Darfur region of Sudan among the IDP in the town of Zalingei. Secondly, we used a convenience sampling method in the data collection. Thus, the findings of this study might not be representative of the whole Darfur region. COVID-19 is a global public health threat that spreads rapidly and causes morbidity, and the mortality rate continues to increase worldwide.

Conclusions

This study found evidence of a moderate level of misconception about COVID-19 among IDP in Sudan. This level of misunderstanding, if not corrected, may affect individuals’ perception of the transmission and treatment of the disease. Furthermore, uneducated individuals have a higher level of a misconception than graduates. Thus, we recommend an education campaign focusing on the individual with a low level of education people to correct any misconceptions they may have regarding the prevention of COVID-19 infection. The findings of this study may help health authorities and policymakers design appropriate awareness programs to fight against misconceptions of COVID-19 among IDPs in Sudan.
References

1. Aghababaeian H, Hamdanieh L, Ostadaghizadeh A. Alcohol intake in an attempt to fight COVID-19: A medical myth in Iran. Alcohol 2020;88:29–32.

2. Ferdous MZ, Islam MS, Sikder MT, Mosaddek ASM, Zegarza-Valdivia JA, Gozl D. Knowledge, attitude, and practice regarding COVID-19 outbreak in Bangladesh: An online-based cross-sectional study. Gańczak M, editor. PLoS One 2020;15(10):e0239254.

3. Baig MI, Jameel TI, Alzahrani SH, et al. Predictors of misconceptions, knowledge, attitudes, and practices of COVID-19 pandemic among a sample of the Saudi population. PLoS One 2020;15(12):e0243526.

4. Delijewski M, Hanez cov J. AI drug discovery screening for COVID-19 reveals zafirlukast as a repurposing candidate. Med Drug Discov 2020;9:100652.

5. Mohamed K, Yazdanpanah N, Saghazadeh A, Rezaei N. Computational drug discovery and repurposing for the treatment of COVID-19: A systematic review. Vol. 106, Bioorganic Chemistry. Academic Press Inc.; 2021. p. 104490.

6. Sayedahmed AMS, Abdalla AAA, Khalid MHM. Knowledge, attitude and practice regarding COVID-19 among Sudanese population during the early days of the pandemic: Online cross-sectional survey. Sci African 2020;10:e00652.

7. Azene ZN, Merid MW, Muluneh AG, et al. Adherence towards COVID-19 mitigation measures and its associated factors among Gondar City residents: A community-based cross-sectional study in Northwest Ethiopia. Di Gennaro F, editor. PLoS One 2020;15(12):e0244265.

8. Algaissi AA, Allarabi NK, Hassamain M, Hashem AM. Preparedness and response to COVID-19 in Saudi Arabia: Building on MERS experience. J Infect Public Health 2020;13(6):834–838.

9. Izekor ED, Okpuzor VN, Morka E, Nnaji PT. A Review of COVID-19 Pandemic: Myths, Misconceptions, and Role of Media Education in Nigeria. Asian J Res Infect Dis 2020;5(4):10–9.

10. Puspitasari IM, Yusuf L, Sinuraya RK, et al. Knowledge, Attitude, and Practice During the COVID-19 Pandemic: A Review. J Multidiscip Healthc 2020;13:727–33.

11. Teja VK, Vasundhara KA, Sriram G. Knowledge, awareness, and practice of dentists in preventing-novel coronavirus (COVID-19) transmission-a questionnaire-based cross-sectional survey. Brazilian Dent Sci 2020;23:1–9.

12. Arman A, Tajik M, Nazempour M, et al. Risk factors of developing critical conditions in Iranian patients with COVID-19. Glob Epidemiol 2021;3:100046.

13. Najera H, Ortega-Avila AG. Health and Institutional Risk Factors of COVID-19 Mortality in Mexico, 2020. Am J Prev Med 2021;60(4):471–477.

14. Okoro J, Ekeroku A, Nweze B, et al. Attitude and preventive practices towards COVID-19 disease and the impact of awareness training on knowledge of the disease among correctional officers. Emerald Open Research 2022;2:51.

15. Gohel KH, Patel PB, Shah PM, et al. Knowledge and perceptions about COVID-19 among the medical and allied health science students in India: An online cross-sectional survey. Clin Epidemiol Glob Health 2021;9:104-109.

16. Sahoo S, Padhy SK, Ipsita J, et al. Demystifying the myths about COVID-19 infection and its societal importance. Asian J Psychiatr 2020;54:102244.

17. Agymang DO, Bondah EK, Agymang DO. Factors predicting knowledge on COVID-19 misconceptions and perception of government efforts in Ghana: a cross-sectional study. Int J Sci Reports Bond EK al Int Sci J Rep 2020;6(9):340–8.

18. Schmidt T, Cloete A, Davids A, et al. Myths, misconceptions, othering and stigmatizing responses to Covid-19 in South Africa: A rapid qualitative assessment. PLoS One 2020;15(12):e0244420.

19. Abiola Okunlola M, Lampety E, Senkyire EK, et al. Perceived Myths and Misconceptions about the Novel COVID-19 Outbreak. SciMedicine J 2020;2(3).

20. Kebede Y, Birhanu Z, Fufa D, et al. Myths, beliefs, and perceptions about COVID-19 in Ethiopia: A need to address information gaps and enable combating efforts. Mallhi TH, editor. PLoS One 2020;15(11):e0243024.

21. Mahmoud EM, Pal I, Ahmad MM. Assessing public health risk factors for internally displaced households in North Darfur, Sudan. Disaster Prev Manag An Int J 2021;30(2):225–39.

22. Mistry SK, Ali ARMM, Yadav UN, et al. Misconceptions about COVID-19 among older Rohingya (forcibly displaced Myanmar nationals) adults in Bangladesh: findings from a cross-sectional study. BMJ Open 2021;11(5):e050427.

23. Kuwayama DP, Chu KM, Hartman Z, et al. Surgical Needs of Internally Displaced Persons in Kerenik, West Darfur, Sudan. Surg LOW MIDDLE INCOME Ctries World J Surg 2020;44:3224–36.

24. Hassana SA, Edwards JK, Venables E, et al. conflict and tuberculosis in Sudan: A 10-year review of the National Tuberculosis Programme, 2004-2014. Confl Health 2018;12(1):18.

25. Kranz O, Sachs A, Lang S. Assessment of environmental changes induced by the internally displaced person (IDP) camps in the Darfur region, Sudan, based on multitemporal MODIS data. Int J Remote Sens 2015;36(1):190–210.

26. WHO. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public A for public [Internet]. [cited 2020 J 1].

27. https://www.cdc.gov/coronavirus/2019 - ncov/prevent-getting-sick/prevention.html CCD 2019 (COVID-19) – P & T [Internet]. C for DC and P 2020 [cited 2020 J 1].

28. Organization WH. Coronavirus disease (COVID-19) advice for the public: myth busters. 2020: Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters.

29. Sahoo S, Padhy SK, Ipsita J, et al. Demystifying the myths about COVID-19 infection and its societal importance. Asian J Psychiatr 2020;54:102244.

30. Grotenhuis M te, Thijs P. Dummy variables and their interactions in regression analysis: examples from research on body mass index [Internet]. 2015 [cited 2020 Jun 29]. Available from: https://www.researchgate.net/publication/284156962_Dummy_variables_an d_their_interactions_in_regression_an alysis_examples_from_research_on_bod y_mass_index

31. Stefanski R. Multiple regression analysis: Inference. In Springer, Cham; 2014 p. 1–46.

32. Claude KM, Serge MS, Alexis KK, Hawkes MT. Prevention of COVID-19 in internally displaced persons camps in War-Torn North Kivu, the Democratic Republic of the Congo: A mixed-methods study. Glob Heal Sci Pract 2020;8(4):638–53.

33. Goruntla N, Bhupalam P, Jinka DR, et al. Knowledge, perception, and practices towards COVID-19 pandemic among general public of India: A cross-sectional online survey. Curr Med Res Pract 2020;10(4):153–9.

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