

Article

Knowledge, Attitude and Practice during the COVID-19 Pandemic in South-East Gabon

Roméo Karl Imboumy-Limoukou ^{1,*}, Barthélemy Ngoubangoye ^{1,*}, Serge Ely Dibakou ¹, Sandrine Lydie Oyegue-Liabagui ^{1,2}, Franck Mounioko ¹, Lady Charlene Kouna ¹, Walter Roddy Matangoye ¹, Steede Seinnat Ontoua ¹, Nancy Cheronne Mbani Mpega ¹ and Jean-Bernard Lekana-Douki ^{1,3}

¹ Centre International de Recherches Médicales de Franceville, BP 769 Franceville, Gabon; sergeelydibakou@cirmf-gabon.com (S.E.D.); sandrineoyegue@cirmf-gabon.com (S.L.O.-L.); frankmounioko@cirmf-gabon.com (F.M.); charleneklc@gmail.com (L.C.K.); matangoyew@gmail.com (W.R.M.); ontouaseinnat@gmail.com (S.S.O.); fayardmouyopa@gmail.com (N.C.M.M.); jb.lekanadouki@cirmf-gabon.com (J.-B.L.-D.)

² Laboratoire de Recherches en Immunologie, Parasitologie et Microbiologie, Ecole Doctorale Régionale d'Afrique Centrale en Infectiologie Tropicale (ECODRAC), Université des Sciences et Techniques de Masuku, BP 876 Franceville, Gabon

³ Département de Parasitologie-Mycologie, Université des Sciences de la Santé, BP 4009 Libreville, Gabon

* Correspondence: karlimboumy@cirmf-gabon.com (R.K.I.-L.);

barthelemyngoubangoye@cirmf-gabon.com (B.N.); Tel.: +241-66072638 (R.K.I.-L.); +241-62521239 (B.N.)

† These authors contributed equally to this work.



Citation: Imboumy-Limoukou, R.K.; Ngoubangoye, B.; Dibakou, S.E.; Oyegue-Liabagui, S.L.; Mounioko, F.; Kouna, L.C.; Matangoye, W.R.; Ontoua, S.S.; Mbani Mpega, N.C.; Lekana-Douki, J.-B. Knowledge, Attitude and Practice during the COVID-19 Pandemic in South-East Gabon. *Behav. Sci.* **2022**, *12*, 226. <https://doi.org/10.3390/bs12070226>

Academic Editors: Davide Mazzoni, Ilaria Cutica and Gabriella Pravettoni

Received: 30 March 2022

Accepted: 19 May 2022

Published: 11 July 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract: COVID-19 is an emerging respiratory disease; it was declared a global pandemic by the World Health Organization. This survey aimed to describe the knowledge, attitudes, perception and practices of the Gabonese public towards COVID-19. This study was performed on 1016 participants. All participants filled in the questionnaire voluntarily, reporting demographic characteristics and answering questions assessing their level of knowledge, attitudes, perceptions and practice towards COVID-19. Among participants, there were 535 men and 476 women. The mean age of the participants was 33.2 ± 16.7 years old. Almost all participants (98.1%) said that they had heard about COVID-19 but only 2.8% knew the pathogenic agent responsible for COVID-19. More than 80% knew that the disease could be transmitted by greeting infected people (87.3%), kissing an infected person (90.0%), touching an infected doorknob (83.5%) and attending meetings (83.9%). The mean knowledge score was higher among younger than older participants, higher among participants living in urban areas than those living in rural areas and higher among participants with higher levels of education than those with lower levels of education. In general, respondents had good knowledge of COVID-19 and a positive attitude towards using protective measures; however, there were differences according to gender, age group, place of residence, professional group and level of education.

Keywords: COVID-19; Gabon; knowledge; practice; perceptions; attitude; rural; urban

1. Introduction

In December 2019, coronavirus disease 2019 (COVID-19) emerged in Wuhan, China. COVID-19 is a highly contagious disease which has spread to more than 200 countries and has been declared a global pandemic by the World Health Organization (WHO) [1,2].

To date (January 2021), it has infected nearly 86 million people, of whom 2,455,131 have died as a result of the disease [3]. COVID-19 is caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), an enveloped virus with positive single-stranded RNA belonging to the family Coronaviridae. Members of this family cause flu-like symptoms which can range from a simple cold to severe symptoms, such as severe acute respiratory syndrome (SARS) [4,5]. This is the case of SARS-CoV-1 (Severe Acute Respiratory Syndrome Coronavirus 1), causing more than 8000 cases with 10% mortality

and MERS-CoV (Middle East Respiratory Syndrome Coronavirus) causing 857 cases with 35% mortality [6].

There are now several vaccines with varying protection rates but there are none available in Gabon and no definitive therapy for SARS-CoV-2 has been developed. The application of preventive measures remains the best means of fighting SARS-CoV-2, especially in Africa where many health systems are not well equipped to face this epidemic.

Preventive measures have been promoted by the World Health Organization (WHO) and relayed by the health authorities to curb the spread of the virus. Compliance with these control measures is essential and is heavily influenced by the knowledge, attitudes and practices (KAP) towards COVID-19 [7,8].

In Gabon, the first case of COVID-19 was declared on 12 March 2020, involving a Gabonese person returning from holidays in France. Since this case was declared, 14,234 cases have been confirmed, with more than 70 deaths (24 February 2021), despite the awareness campaigns implemented by the Gabonese government via the media. “Fake news” propagated on social networks and relayed by word of mouth creates panic in the population and reduces compliance with the awareness messages communicated by authorities [9,10]. In the media, awareness messages are generally in French, whereas some people in rural areas speak only their local language. This situation could impede the public health response. To adapt public health response strategies, studies of knowledge, attitudes and practices can provide baseline data to determine the type of intervention that may be required to change misconceptions about SARS-CoV-2 in the community.

In this context, the objective of this study is to understand the knowledge, perceptions, attitudes and practices relating to COVID-19 among people living in rural and urban areas in Gabon. Since the pandemic was declared, no such studies have been conducted in Gabon.

2. Materials and Methods

2.1. Study Area

The study was conducted in rural and urban areas of southeast Gabon. The urban area was Franceville, the capital of the Haut-Ogooué Province, and the third largest town in Gabon in terms of population (pop. 110,568 inhabitants) [11]. The rural areas were 9 villages in Lombo-Bouengué, department of Ogooué-lolo Province: Toundi-Odounga, Dienga, Iwetsi, Grand Village, Mourombo-Fouala, Maranda1, Maranda2, Siono and Isseme. These villages are situated near the border with the Republic of Congo and have in total around 2000 inhabitants.

2.2. Study Design and Population

This community-based, cross-sectional, descriptive study was conducted from 7 to 11 September 2020. The study population was composed of inhabitants aged 10 years old and older. Inclusion criteria stipulated that participants must reside in the study site during the study. It is crucial to note that one possible problem with surveys that ask respondents for either their policy support for or compliance with COVID-19 policies is the presence of social desirability bias, according to [12].

2.3. Sampling

In villages, all the people concerned (aged 10 years old and older) were interviewed. In Franceville, we divided the city into eight (8) points.

From these points, investigations were carried out simultaneously in a random manner. To reduce bias of household selection, the first house visited was determined by a random method. We assigned a number (1–8) to each interviewer and let the interviewer select the first house on the basis of counting that number from the closest house to the drop-off point. The sampling interval was then used to select subsequent households. The sampling interval was 10 (i.e., every 10th house would be visited).

2.4. Study Tools

The survey questionnaire was designed in French, the national language in Gabon, and translated into local languages (*Nzebi, Obamba and Téké* languages) by the interviewers when necessary. The surveys started with a short presentation of the project, and we asked participants to say whether they agreed to participate in the study voluntarily. We conducted in person interviews, approximately 30 min in length. These interviews were used to explain the objectives of the project as misinformation has created mistrust and not everyone has the same level of understanding. Questions covered socio-demographic characteristics of the participant, knowledge of COVID-19, attitudes to protective measures against COVID-19 and practices relevant to COVID-19. In order to determine the level of knowledge of the participants, we asked questions on the general knowledge of COVID-19 with a questionnaire including predefined answers, in particular on the symptoms, the means of transmission, the prevention measures and the perception of the disease. Answers were Yes, No or I don't know.

2.5. Statistical Analysis

We assessed each participant's knowledge of COVID-19 as described previously [13]. We gave one point for all correct responses and zero points for unanswered questions or incorrect answers.

We conducted Student's *t* and ANOVA tests using R software Version 4.0.2 to test the relationship between knowledge score and socio-demographic variables. Where ANOVA tests were significant, we used the Tukey correction for multiple comparisons.

All *p* values were based on two-sided tests and were considered statistically significant at $p < 0.05$.

2.6. Ethical Considerations

The Gabonese National Ethics Committee (CNER) approved our study protocol and procedures, (N°003/2020/CNER/SG/P of 1 February 2020). Respondents' anonymity and confidentiality were ensured by assigning numbers to participants. "Informed consent was obtained from all subjects involved in the study". Furthermore, "Written informed consent has been obtained from all the patients to publish this paper". For children, consent was sought from their parents/guardians, as recommended by CNER.

3. Results

A total of 1016 participants completed the survey. The mean age was 33.2 ± 16.7 ; 535 (52.7%) were male and 476 (46.9%) were female. Of the 1016 respondents, 494 (48.6%) resided in rural areas (out of a total of 2000 people) whereas 522 (51.4%) resided in urban areas (out of a population of 5000 people).

Nearly two thirds (63.1%) were single. More than half (59.1%) had completed higher studies, 24.0% had preparatory or high school education, 11.3% were university graduates and 5.0% had no education. About one third (35.3%) of participants were students. Other demographic characteristics are detailed in Table 1.

Almost all participants (98.1%) said that they had heard about COVID-19 and 8.3% of them believed that the disease does not exist. Only 2.8% knew the pathogenic agent of COVID-19.

More than 80% knew that the disease could be transmitted by greetings (87.3%), kissing an infected person (90.0%), touching infected doorknobs (83.5%) and attending meetings (83.9%).

Regarding the symptoms of COVID-19, the respondent's answers were: 85.1% fever, 78.6% headaches, 55.5% aches and pains, 99.0% dry cough, 32.8% stomach ache, 70.3% loss of taste, 51.3% vomiting, 83.9% difficulty breathing, 74.0% throat irritation, 74.6% fatigue and 75.7% runny nose (Table 2). In terms of prevention measures, almost all participants knew that washing hands (94.5%), wearing a mask (94.7%) and maintaining an appropriate distance (1 m) between yourself and anyone with symptoms (93.0%) were the best ways to

prevent COVID-19. Furthermore, 76.0% thought that avoiding touching a contaminated surface and then touching your eyes could prevent COVID-19 infection. More than half of respondents thought that the disease could be prevented using steam baths (50.6%) and 44.1% of participants thought that traditional medicines could be effective against the disease. For further details, see Table 2.

Table 1. Socio-demographic characteristics of the participants ($n = 1016$).

| Socio-Demographic Characteristics | Number (N ^o) | Percentage (%) |
|-----------------------------------|--------------------------|----------------|
| Sexes | | |
| Male | 535 | 52.66 |
| Female | 476 | 46.85 |
| Age groups in years | | |
| 10–20 | 223 | 21.95 |
| 20–30 | 293 | 28.84 |
| 30–40 | 198 | 19.49 |
| 40–50 | 142 | 13.98 |
| 50–60 | 80 | 7.87 |
| ≥60 | 79 | 7.78 |
| Area of residence | | |
| Urban | 494 | 48.62 |
| Rural | 522 | 51.38 |
| Profession | | |
| Student | 359 | 35.33 |
| Retired | 15 | 1.48 |
| Unemployed | 304 | 29.92 |
| Employed | 337 | 33.17 |
| Level of education | | |
| Primary school | 244 | 24.02 |
| None | 51 | 5.02 |
| High school | 600 | 59.06 |
| University | 115 | 11.32 |
| Marital status | | |
| Single | 641 | 63.09 |
| Cohabitation | 205 | 20.18 |
| Married | 123 | 12.11 |
| Widower | 47 | 4.63 |

Table 2. Knowledge about COVID-19 among the participants ($n = 1016$).

| Knowledge Items | Yes | | No | | Don't Know | |
|----------------------------------------------------------|-----|-------|-----|-------|------------|-------|
| | No | % | No | % | No | % |
| COVID-19 | | | | | | |
| Have you ever heard of COVID-19? | 997 | 98.13 | 11 | 1.08 | 8 | 0.79 |
| Does it exist? | 803 | 79.04 | 84 | 8.27 | 129 | 12.70 |
| Pathogenic agent? | 28 | 2.76 | 5 | 0.49 | 983 | 96.75 |
| Route of transmission (how the disease is spread) | | | | | | |
| By salt water? | 186 | 18.31 | 629 | 61.91 | 201 | 19.78 |
| By greetings? | 887 | 87.30 | 86 | 8.46 | 43 | 4.23 |
| By kissing people? | 914 | 89.96 | 52 | 5.12 | 50 | 4.92 |
| By sexual relationships? | 461 | 45.37 | 346 | 34.06 | 209 | 20.57 |
| By goods from China? | 494 | 48.62 | 285 | 28.05 | 237 | 23.33 |
| By eating bushmeat? | 260 | 25.59 | 577 | 56.79 | 179 | 17.62 |
| By touching door cuff? | 848 | 83.46 | 70 | 6.89 | 98 | 9.65 |
| By being in contact with stool/urine? | 311 | 30.61 | 475 | 46.75 | 230 | 22.64 |
| By attending meetings? | 852 | 83.86 | 74 | 7.28 | 90 | 8.86 |

Table 2. Cont.

| Knowledge Items | Yes | | No | | Don't Know | |
|----------------------------------------------------------------------------------------------------|-----|-------|-----|-------|------------|-------|
| | No | % | No | % | No | % |
| By being in closed space? | 293 | 28.84 | 598 | 58.86 | 125 | 12.30 |
| By playing with animals (pets)? | 338 | 33.27 | 467 | 45.96 | 211 | 20.77 |
| By being in contact with asymptomatic people? | 464 | 45.67 | 383 | 37.70 | 169 | 16.63 |
| Symptoms (What are the symptoms of COVID-19) | | | | | | |
| Fever? | 865 | 85.14 | 81 | 7.97 | 70 | 6.89 |
| Headaches? | 799 | 78.64 | 133 | 13.09 | 84 | 8.27 |
| Soreness? | 564 | 55.51 | 320 | 31.50 | 132 | 12.99 |
| Dry cough? | 833 | 81.99 | 98 | 9.65 | 85 | 8.37 |
| Stomach aches? | 333 | 32.78 | 505 | 49.70 | 177 | 17.42 |
| Lost of taste? | 714 | 70.28 | 181 | 17.81 | 121 | 11.91 |
| Vomiting? | 521 | 51.28 | 332 | 32.68 | 163 | 16.04 |
| Difficulty breathing? | 852 | 83.86 | 74 | 7.28 | 90 | 8.86 |
| Sore throat? | 752 | 74.02 | 153 | 15.06 | 111 | 10.93 |
| Tiredness? | 758 | 74.61 | 152 | 14.96 | 106 | 10.43 |
| Runny nose? | 769 | 75.69 | 105 | 10.33 | 142 | 13.98 |
| Prevention measures to avoid COVID-19 (What are the preventive measures to avoid COVID-19?) | | | | | | |
| Wash hands? | 960 | 94.49 | 17 | 1.67 | 39 | 3.84 |
| Wear a mask? | 962 | 94.69 | 21 | 2.07 | 33 | 3.25 |
| Maintain a distance of 1 m from other people? | 945 | 93.01 | 44 | 4.33 | 26 | 2.56 |
| Take antibiotics? | 325 | 31.99 | 453 | 44.59 | 238 | 23.43 |
| Take traditional medicines? | 448 | 44.09 | 393 | 38.68 | 174 | 17.13 |
| Do steam baths? | 514 | 50.59 | 342 | 33.66 | 160 | 15.75 |
| Avoid touching nose/eyes? | 772 | 75.98 | 134 | 13.19 | 110 | 10.83 |
| Drink garlic, ginger, lemon infusions? | 452 | 44.49 | 335 | 32.97 | 229 | 22.54 |
| Is there a vaccine against COVID-19? | 212 | 20.87 | 470 | 46.26 | 334 | 32.87 |
| Is there a treatment? | 505 | 49.70 | 271 | 26.67 | 239 | 23.52 |

Concerning participant's perceptions of and attitudes to COVID-19, 91.9% of participants thought that it is dangerous, 90.7% thought it could kill, 46.3% thought it is a laboratory invention and 63.3% thought that it affects only white people. Of people interviewed, 29.1% still continued to greet people with a handshake, 90.1% said they wore a mask in public places, 88.1% said they washed their hands regularly and 62.2% of respondents stated that they were following the global pandemic situation. Furthermore, 77.0% accepted the quarantine measures, 52.0% were in favour of vaccination but only 20.9% thought vaccination would protect them. In addition, 81.3% of participants said they would wear protective and control measures to limit the spread of the disease. Further aspects of participant perceptions and attitudes are reported in Table 3.

Knowledge scores were significantly different across gender, age group, area of residence, occupation group and level of education (Table 4). Men's knowledge score was higher than women's ($p < 0.001$). In general, age group had a significant impact on knowledge scores ($p < 0.001$). The age groups under 40 have significantly higher knowledge scores than the age groups over 40. There are significant differences between 10–20 and 40–50 ($p = 0.003$), between 10–20 and over 60 years ($p < 0.001$), between 20–30 and 40–50 ($p = 0.001$), between 20–30 and over 60 years old ($p < 0.001$) and between 30–40 and over 60 years old ($p < 0.001$) (Table 4). Respondents living in urban areas had a significantly higher knowledge score than rural residents ($p < 0.001$). Participants with university education or higher had significantly higher knowledge scores than those with lower levels of education. Employed participants had higher scores than unemployed participants.

Table 3. Perceptions and attitudes of the participants about COVID-19 ($n = 1016$).

| Items | Yes | | No | | Don't Know | |
|----------------------------------------------------------------------------------------|-----|-------|-----|-------|------------|-------|
| | No | % | No | % | No | % |
| Participants' perception of COVID-19 | | | | | | |
| Is COVID-19 a dangerous disease? | 934 | 91.93 | 35 | 3.44 | 47 | 4.63 |
| Is it a fatal disease? | 921 | 90.65 | 45 | 4.43 | 50 | 4.92 |
| A shameful disease? | 312 | 30.71 | 609 | 59.94 | 95 | 9.35 |
| Is it a stigmatizing disease? | 547 | 53.84 | 332 | 32.68 | 137 | 13.48 |
| Do you think we are exaggerating about this disease? | 502 | 49.41 | 380 | 37.40 | 133 | 13.09 |
| Do you think the virus was made in the laboratory? | 470 | 46.26 | 265 | 26.08 | 279 | 27.46 |
| Can a person have COVID-19 multiple times? | 436 | 42.91 | 306 | 30.12 | 274 | 26.97 |
| Is it a disease that kills white people more? | 643 | 63.29 | 246 | 24.21 | 127 | 12.50 |
| Do cold climates favour the disease? | 650 | 63.98 | 172 | 16.93 | 194 | 19.09 |
| Do warm climates slow the spread? | 636 | 62.60 | 204 | 20.08 | 176 | 17.32 |
| Attitude of participants to COVID-19 | | | | | | |
| Among colleagues, do you greet each other by shaking hands? | 296 | 29.13 | 7 | 0.69 | 713 | 70.18 |
| Do you wear a mask in public spaces? | 917 | 90.26 | 92 | 9.06 | 7 | 0.69 |
| Do you wash your hands regularly? | 895 | 88.09 | 116 | 11.42 | 5 | 0.49 |
| Do you follow the news about the pandemic? | 632 | 62.20 | 379 | 37.30 | 5 | 0.49 |
| Will you agree to quarantine yourself if you test positive? | 782 | 76.97 | 229 | 22.54 | 5 | 0.49 |
| Has wearing a mask become a reflex for you? | 676 | 66.54 | 336 | 33.07 | 4 | 0.39 |
| If you are in contact with a positive person, will you contact the health authorities? | 840 | 82.68 | 172 | 16.93 | 4 | 0.39 |
| If a vaccine is available, will you get vaccinated? | 528 | 51.97 | 483 | 47.54 | 5 | 0.49 |
| Do you still respect the barrier measures? | 826 | 81.30 | 185 | 18.21 | 5 | 0.49 |

Table 4. Relationship between socio-demographic characteristics of the participants and their knowledge scores about COVID-19 ($n = 1016$).

| Socio-Demographic Characters | Category | Knowledge Score | | Test of sig. (p) |
|------------------------------|----------|-----------------|------------|--------------------------------------|
| | | Min-Max | Mean SD | |
| Sex | | | | $t = -4.14 (<0.001)^*$ |
| Male | | 0–33 | 21.1 ± 5.0 | |
| Female | | 0–33 | 20.0 ± 5.0 | |
| Age (years) | | | | $F = 10.57 (<0.001)^*$ |
| 10–20 | a | 0–31 | 21.4 ± 4.1 | e vs. f = 0.05, c vs. f < 0.001 # |
| 20–30 | b | 1–33 | 21.4 ± 4.1 | b vs. f < 0.001 #, a vs. f < 0.001 # |
| 30–40 | c | 0–33 | 20.3 ± 5.6 | b vs. d = 0.001 #, a vs. d = 0.003 # |
| 40–50 | d | 0–28 | 19.4 ± 6.0 | |
| 50–60 | e | 1–27 | 20.0 ± 5.0 | |
| ≥60 | f | 0–28 | 17.6 ± 6.0 | |
| Are of residence | | | | $t = -5.94 (<0.001)^*$ |
| Urban | | 2–33 | 21.4 ± 4.4 | |
| Rural | | 0–29 | 19.6 ± 5.4 | |
| Profession | | | | $F = 15.56 (<0.001)^*$ |
| Student | a | 1–33 | 22.0 ± 4.0 | d vs. c < 0.001 #, a vs. c < 0.001 # |
| Retired | b | 17–28 | 21.0 ± 3.0 | a vs. d = 0.001 # |
| Unemployed | c | 0–28 | 19.0 ± 6.0 | |
| Employed | d | 0–33 | 20.4 ± 5.0 | |
| Level of education | | | | $F = 40.2 (<<0.001)^*$ |
| Primary school | a | 0–29 | 19.4 ± 5.0 | a vs. b < 0.001 #, c vs. b < 0.001 # |
| None | b | 0–27 | 15.0 ± 8.4 | d vs. b < 0.001 #, c vs. a < 0.001 # |
| High school | c | 0–31 | 24.0 ± 4.3 | d vs. a < 0.001 #, d vs. c < 0.001 # |
| University | d | 14–33 | 23.1 ± 4.0 | |
| Marital status | | | | $F = 12.24 (<0.001)^*$ |
| Cohabitation | a | 0–28 | 19.4 ± 6.1 | b vs. d < 0.001 #, b vs. d < 0.001 # |
| Single | b | 0–33 | 21.2 ± 4.4 | b vs. c = 0.003 # |
| Married | c | 1–28 | 19.5 ± 5.0 | |
| Widower | d | 0–26 | 18.4 ± 6.0 | |

t Student's t test, F analysis of variance (ANOVA) test. * Statistically significant at $p < 0.05$. # Categories of variables with significant ANOVA results. Multiple comparisons between each 2 categories are done by post hoc analysis (Tukey).

The comparison of knowledge scores by questionnaire item shows that the urban population is better informed about COVID-19 symptoms and preventive measures than the rural population ($p < 0.001$) (Table 4).

4. Discussion

Even if Africa has been relatively less affected than the other continents [14,15], the disease continues to spread and remains the primary health concern of the continent. In Gabon, various awareness programs have been put in place (television, radio, social networks and internet) by the health authorities and measures including a ban on grouping, curfews and mask-wearing have been put in place to prevent the disease. However, no study has yet been carried out on the level of knowledge and good practices towards COVID-19. We present and discuss here the results of a survey of the knowledge, perceptions and attitudes of people in south-eastern Gabon towards the disease.

4.1. Knowledge of Means of Transmission, Symptoms and Prevention Measures

The surveys show that people we interviewed had a good general knowledge of COVID-19. Almost the entire sample had heard of COVID-19 and the majority were aware of the prevention measures, mode of transmission and most of the symptoms. This good general knowledge is consistent with other studies in the world [13,16–18] and may be due to efforts by the government via awareness campaigns and daily warning messages sent from the government and the Ministry of Health to everyone's mobile telephones and awareness campaigns on national media channels. The result may also be explained by the relatively young age of the majority of the study population and their frequent use of social media platforms, knowing that in 2020 the internet represented the most important information source [19]. However, (i) less than 3% of respondents knew the pathogenic agent and those who did were from urban areas and had a high level of education. This may be because awareness campaigns are focused on prevention and people usually called the disease coronavirus rather than COVID-19, so they did not know that SARS-CoV-2 is the virus responsible for COVID-19. (ii) 32.0% of respondents thought that antibiotics could be effective against COVID-19 and 23.4% did not know if antibiotics could cure COVID-19. The purchase of non-prescribed antibiotics is a common practice in Sub-Saharan Africa [19], and the panic caused by the COVID-19 pandemic [9] may lead to the consumption of antibiotics, which is known to be a major driver of antimicrobial resistance [19]. (iii) Only 20.9% of the sample think that the vaccine can stop the disease and 46.26% think that the vaccine will not protect against the disease. This result could be explained by the misinformation that has circulated on social networks about vaccines that are harmful to the reproduction of the African population and that vaccination would allow the control of populations. Specific immunization awareness programs should be conducted by the authorities to address this. (iv) Urban populations have better knowledge of COVID-19, symptoms and means of prevention. These results could be explained by the limited access to the media in rural areas, whereas in urban areas there are diverse sources of information. Women have lower scores than men and educated people have better levels of knowledge than uneducated people. However, these differences are very small, although significant. As envisaged by Zhang et al., specific outreach programs could be designed to target particular demographic social groups [20], such as villagers, women or uneducated or poorly educated populations.

4.2. Perceptions of Participants

Almost all (91.9%) of the respondents believe that COVID-19 threatens life and may be a cause of death (90.7%). These results show that populations have understood the dangerousness of the disease. However, nearly half (49.4%) think the effects of the disease are exaggerated. These perceptions may be due to media pressure. At the beginning of the pandemic, the media covered it intensely. Almost half (46.3%) of the people interviewed thought that COVID-19 was manufactured in a lab. This proportion is much higher than

the proportion found by [21]; this could be explained by the particular African continent context and especially the timing of the study.

More than half thought COVID-19 is a disease of “white people” and that a hot climate could stop the spread of the disease. This pattern may be because people’s major source of information is social media. Fake news, misinformation and rumour-mongering are common due to a surge in the use of the internet and social media [13,22,23]. Unfortunately, information from social networks seems to circulate more easily in the general population than the scientific information which rejects this hypothesis [24].

4.3. Attitudes of Participants towards Control Measures

The majority of respondents took the precautions necessary to avoid contracting COVID-19. More than three-quarters of participants said they wear a mask in public places, wash their hands regularly, respect protective and control measures, will accept quarantine if they test positive and will contact the health authorities if they test positive. More than half say that they are informed about the progress of the pandemic. This positive attitude may result from information about the disease being regularly updated on various mass media channels and the government ensuring that its measures are enforced by the presence of military personnel in public places.

More than half of the study population was willing to obtain the vaccine once it was available, consistent with a study in Egypt [13]. These results show people’s confidence in vaccines, but this result contrasts with vaccine perception because only 20.9% of respondents think that vaccination can protect them. This contradiction illustrates the ambiguity around the COVID-19 vaccine. This ambiguity is illustrated by nearly 47 percent of the population not being ready to be vaccinated if the vaccine is available. This reluctance, already expressed in other studies in Israel or Pakistan [25,26], could be a barrier and a substantial challenge in the fight against the pandemic.

The fight against the pandemic must also include the fight against false information and conspiracy theories circulating on social networks on the quality of vaccines. Some examples are that vaccines would represent a health risk because they have been developed rapidly, the presence of active virus in the vaccines or nano-chips imbedded to control the population with the 5G towers telephone network [26].

5. Conclusions

This study is the first to examine the knowledge, attitudes and practices of Gabonese people relating to COVID-19. In general, respondents had good knowledge of COVID-19 and a positive attitude towards using protective measures, but there were differences according to gender, age group, place of residence, professional group and level of education.

Author Contributions: R.K.I.-L., J.-B.L.-D. and B.N. participated in conceptualization of this study; R.K.I.-L., S.E.D., S.L.O.-L. and B.N. participated in methodology; W.R.M. and F.M. participated in software, R.K.I.-L., B.N. and S.E.D. participated in validation; R.K.I.-L., L.C.K., S.S.O. and N.C.M.M. contributed to the investigation; F.M., S.E.D. and R.K.I.-L. participated in data curation; R.K.I.-L. and B.N. contributed to writing—original draft preparation; J.-B.L.-D. is the guarantor of this article and supervised the study. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of The Gabonese National Ethics Committee. CNER approved our study protocol and procedures, (N°003/2020/CNER/SG/P of 1 February 2020).

Informed Consent Statement: “Informed consent was obtained from all subjects involved in the study” and “Written informed consent has been obtained from all the patient(s) to publish this paper”.

Data Availability Statement: Not applicable here.

Acknowledgments: We thank all the participants of this study.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Spychalski, P.; Blazynska-Spychalska, A.; Kobiela, J. Estimating case fatality rates of COVID-19. *Lancet Infect. Dis.* **2020**, *20*, 774–775. [CrossRef]
2. WHO. Director-General's Opening Remarks at the Media Briefing on COVID-19. 2020. Available online: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--11-march-2020> (accessed on 10 January 2021).
3. World Health Organization. WHO Coronavirus Disease (COVID-19) Dashboard. 2021. Available online: <https://www.covid19.who.int> (accessed on 10 January 2021).
4. Cascella, M.; Bimonte, S.; Amruthraj, N.J. Awareness during emergence from anesthesia: Features and future research directions. *World J. Clin. Cases* **2020**, *8*, 245–254. [CrossRef] [PubMed]
5. Cheng, V.C.; Lau, S.K.; Woo, P.C.; Yuen, K.Y. Severe acute respiratory syndrome coronavirus as an agent of emerging and reemerging infection. *Clin. Microbiol. Rev.* **2007**, *20*, 660–694. [CrossRef] [PubMed]
6. Drosten, C.; Gunther, S.; Preiser, W.; van der Werf, S.; Brodt, H.R.; Becker, S.; Rabenau, H.; Panning, M.; Kolesnikova, L.; Fouchier, R.A.; et al. Identification of a novel coronavirus in patients with severe acute respiratory syndrome. *N. Engl. J. Med.* **2003**, *348*, 1967–1976. [CrossRef]
7. Ajilore, K.A.I.; Onyenakeya, K. College students' knowledge, attitudes and adherence to public service announcements on Ebola in Nigeria: Suggestions for improving future Ebola prevention education programmes. *Health Educ. J.* **2017**, *76*, 648–660. [CrossRef]
8. Tachfouti, N.; Slama, K.; Berraho, M.; Nejari, C. The impact of knowledge and attitudes on adherence to tuberculosis treatment: A case-control study in a Moroccan region. *Pan. Afr. Med. J.* **2012**, *12*, 52.
9. Person, B.; Sy, F.; Holton, K.; Govert, B.; Liang, A. National center for infectious diseases SCOT: Fear and stigma: The epidemic within the SARS outbreak. *Emerg. Infect. Dis.* **2004**, *10*, 358–363. [CrossRef]
10. Zhong, B.L.; Luo, W.; Li, H.M.; Zhang, Q.Q.; Liu, X.G.; Li, W.T.; Li, Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: A quick online cross-sectional survey. *Int. J. Biol. Sci.* **2020**, *16*, 1745–1752. [CrossRef]
11. de la Statistique, D.G. Résultats Globaux du Recensement Général de la Population et des Logements de 2013 du Gabon (RGPL-2013). 2015, p. 11; tableau 19. Available online: <https://gabon.unfpa.org> (accessed on 10 January 2021).
12. Daoust, J.F.; Nadeau, R.; Dassonneville, R.; Lachapelle, E.; Bélanger, É.; Savoie, J.; van der Linden, C. How to Survey Citizens' compliance with COVID-19 public health measures: Evidence from three survey experiments. *J. Exp. Political Sci.* **2021**, *8*, 310–317. [CrossRef]
13. Abdelhafiz, A.S.; Mohammed, Z.; Ibrahim, M.E.; Ziady, H.H.; Alorabi, M.; Ayyad, M.; Sultan, E.A. Knowledge, perceptions, and attitude of Egyptians towards the novel coronavirus disease (COVID-19). *J. Community Health* **2020**, *45*, 881–890. [CrossRef]
14. Hardy, É.J.; Flori, P. Spécificités épidémiologiques de la COVID-19 en Afrique: Préoccupation de santé publique actuelle ou future? *Ann. Pharm. Françaises* **2020**, *79*, 216–226. [CrossRef] [PubMed]
15. Lo, M.S.A.; Yade, S. La COVID-19 en Afrique: Bilan D'étape et Perspectives/COVID-19 Africa. *Prog. Rep. Prospect.* **2020**. Available online: https://media.africaportal.org/documents/RP_20-13_Moubarack_Lo.pdf (accessed on 10 January 2022).
16. Ngwewondo, A.; Nkengazong, L.; Ambe, L.A.; Ebogo, J.T.; Mba, F.M.; Goni, H.O.; Nyunai, N.; Ngonde, M.C.; Oyono, J.E. Knowledge, attitudes, practices of/towards COVID 19 preventive measures and symptoms: A cross-sectional study during the exponential rise of the outbreak in Cameroon. *PLoS Negl. Trop. Dis.* **2020**, *14*, e0008700. [CrossRef] [PubMed]
17. Puspitasari, I.M.; Yusuf, L.; Sinuraya, R.K.; Abdulah, R.; Koyama, H. Knowledge, attitude, and practice during the COVID-19 pandemic: A review. *J. Multidiscip. Healthc.* **2020**, *13*, 727–733. [CrossRef] [PubMed]
18. Van Nhu, H.; Tuyet-Hanh, T.T.; Van, N.T.A.; Linh, T.N.Q.; Tien, T.Q. Knowledge, attitudes, and practices of the Vietnamese as key factors in controlling COVID-19. *J. Community Health* **2020**, *45*, 1263–1269. [CrossRef]
19. AlGhamdi, K.M.; Moussa, N.A. Internet use by the public to search for health-related information. *Int. J. Med. Inform.* **2012**, *81*, 363–373. [CrossRef] [PubMed]
20. Zhang, X.S.Y.; Ye, D.; Sun, Z.; Su, H.; Ni, J. Analysis on mental health status of community residents in Hefei during SARS spread. *Chin. J. Dis. Contr. Prev.* **2003**, *7*, 280–282.
21. Lavigne, M.; Bélanger, É.; Nadeau, R.; Daoust, J.F.; Lachapelle, E. Hide and seek: The connection between false beliefs and perceptions of government transparency. *Harv. Kennedy Sch. Misinform. Rev.* **2022**, *3*. [CrossRef]
22. Lazer, D.M.J.; Baum, M.A.; Benkler, Y.; Berinsky, A.J.; Greenhill, K.M.; Menczer, F.; Metzger, M.J.; Nyhan, B.; Pennycook, G.; Rothschild, D.; et al. The science of fake news. *Science* **2018**, *359*, 1094–1096. [CrossRef]
23. Lee, J.J.; Kang, K.A.; Wang, M.P.; Zhao, S.Z.; Wong, J.Y.H.; O'Connor, S.; Yang, S.C.; Shin, S. Associations between COVID-19 misinformation exposure and belief with COVID-19 knowledge and preventive behaviors: Cross-sectional online study. *J. Med. Internet Res.* **2020**, *22*, e22205. [CrossRef]
24. Kristian, G.A.K.; Rambaut, A. The proximal origin of SARS-CoV-2. *Nat. Med.* **2020**, *26*, 452.

25. Dror, A.A.; Eisenbach, N.; Taiber, S.; Morozov, N.G.; Mizrachi, M.; Zigron, A.; Srouji, S.; Sela, E. Vaccine hesitancy: The next challenge in the fight against COVID-19. *Eur. J. Epidemiol.* **2020**, *35*, 775–779. [[CrossRef](#)] [[PubMed](#)]
26. Khan, Y.H.; Mallhi, T.H.; Alotaibi, N.H.; Alzarea, A.I.; Alanazi, A.S.; Tanveer, N.; Hashmi, F.K. Threat of COVID-19 vaccine hesitancy in Pakistan: The need for measures to neutralize misleading narratives. *Am. J. Trop. Med. Hyg.* **2020**, *103*, 603–604. [[CrossRef](#)] [[PubMed](#)]