



## RESEARCH ARTICLE

# KNOWLEDGE, ATTITUDES AND PRACTICES OF INTERNET USERS' ON COVID-19 IN PHASE1 EPIDEMIC IN CAMEROON: AN ONLINE SURVEY

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### ABSTRACT

**Introduction:** The COVID-19 epidemic began in China in December 2019 and has spread around the world. The symptoms and routes of transmission are still poorly understood by the scientific community and the rest of the world. The Phase 1 of the COVID-19 epidemic in Cameroon was during the period from March-June 2020. Several rumors and ideas have emerged within the population regarding the different aspects of the pandemic. **Materials and methods:** An online survey of Cameroonian (volunteer) Internet users conducted from 23 March to 30 April 2020 described the knowledge, attitudes and practices (KAP) on COVID-19 using the Microsoft-Form Platform and highlights the use of online surveys in times of crisis for population assessment. **Results:** One hundred and thirty-seven participants (46.7% female; 53.2% male) aged 12-50 responded to the online survey. Almost 98.54% of respondents correctly reported all the symptoms observed in a suspected case of COVID-19. A minority thought that the infection cannot be cured (11.6%); 30.6% agreed that it was an invention to decimate the African black race, and 87.5% thought that it is a curse of the gods. Only 2.9% knew at least one infected person in their community, 54.0% thought their environment was a risk factor. Only 30.6% of people cited five correct and combined methods for prevention; 31.3% confirmed that they had observed at least six government-issued barrier measures. The major sources of information on COVID-19 were the internet (81.7%); television (73.7%) and social media (70.80%). **Conclusion:** The majority of Internet users were aware of the symptoms of COVID-19, some had unscientific beliefs about its origin. We observed a small proportion of prevention practices to COVID 19 among Internet users. A mass awareness campaign in all regions of the country on the need for barrier measures against COVID-19, to combat its stigma and encourage case reporting to limit the spread of the epidemic is essential.

## INTRODUCTION

A new public health crisis is threatening the world, with the emergence and spread of the new coronavirus 2019 (2019-nCoV) or severe acute respiratory coronavirus 2 syndrome (SARS-CoV-2). The virus is native to bats and was transmitted to humans by as yet unknown intermediate animals in Wuhan, Hubei Province, China, in December 2019 (1). According to the World Health Organization (WHO), this is a new variant of coronavirus. Most people infected with COVID-19 will suffer from mild to moderate respiratory disease and recover without special treatment. Older people and those with underlying medical conditions such as cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop a serious disease (2). As of March 30<sup>th</sup>, 2020, approximately 697,224 cases of coronavirus have been reported worldwide (COVID-2019) and 33,297 deaths have been reported with 203 affected countries (3). Between March and April 2020, approximately 1866 cases had been reported in Cameroon distributed in several regions (4). To prevent infection at the community level, it is recommended that people avoid overcrowded areas and postpone non-essential travel to places where transmission is continuous, practice cough hygiene by coughing in the elbow crease and/or on a handkerchief for

use rather than in the hands and practicing hand hygiene frequently (washing hands with runny water and soap or using a hydroalcoholic gel) every 15 to 20 minutes. Patients with respiratory symptoms should be asked to use surgical masks in public, isolate themselves and contact the appropriate services for management. In China, the public has been asked to wear masks in public and especially in overcrowded areas, and large-scale gatherings are prohibited (leisure parks, etc.). Several countries, at the time of Cameroon's deadline, have also adopted similar measures such as: school closures; closing borders with the exception of cargo ships and ships carrying mass consumer goods, essential goods and equipment with limited and supervised stopover time; systematic closure from 6 p.m. of drinking establishments, restaurants and leisure venues; introducing a system to regulate the flow of consumers into markets and shopping centers; Avoid overloading in buses, taxis and motorbixs, mandatory wearing of masks on public transport. In the period from March to April 2020: Phase 1 of the epidemic in Cameroon (5), several rumors and ideas have emerged in communities, social networks, which may influence people's knowledge, attitudes and practices about COVID-19. With the onset of the pandemic; restricting the movement of people, preventing the transmission of COVID-19, limiting groupings and physical encounters were strongly recommended by the government and civil society organizations to the profile of virtual meetings and

groupings. This allows for more communication and discussion on social networks. This online survey was designed to describe the knowledge, attitudes and practice of Internet users about COVID-19 in the ascendant phase of the pandemic in Cameroon. The study also highlights the use of online surveys in times of crisis to assess people's knowledge and practices.

## METHODS AND MATERIALS

This was a cross-sectional descriptive study of users of two-gender social networks who voluntarily agreed to participate in the online survey. Participants received a post of advice on the questionnaire for the survey on the knowledge, attitudes and practices on COVID-19 of people living in Cameroon. The form was designed on the Microsoft Form platform and posted on March 23, 2020, and a response link to the form was shared with users on social networks including Facebook; WhatsApp and Twitter. The questionnaire was posted 05 times on Facebook groups, twice on tweeter and 05 times in WhatsApp groups. The link was accompanied by an explanatory note of the objectives of the investigation, the target persons and the free consent to participate. Internet users completed the online questionnaire during the period from March 23 to April 30, 2020. The functional requirements of the online survey system were as follows. Responses can be given on any device that supports a web browser. The display and operability of the system was automatically optimized for computers, smartphones and tablets. To ensure that the system can work smoothly on smartphones and tablets, compatibility has been tested with the latest version of browsers available at the time of service delivery, i.e. on Safari for iOS and Chrome and other browsers for Android. On computers, system compatibility has been tested on Windows 10 and later versions of Internet Explorer, Firefox and Chrome. The online response system included a login function, a survey response function, and a submission function. Using the Microsoft Form open source online survey system, we customized the platform as follows. To preserve confidentiality, the responses were anonymous. The screen structure of the entry form was the same for computers, smartphones and tablets. The following verification functions were available: an entry range check, a mandatory field check. The data collected was downloaded and analyzed on Excel 2010 and Epi Infos 7, for the calculation of proportions and development of graphs.

## RESULTS

**Demographic Social Data:** In the period from March 23 to April 30, 2020, one hundred and thirty-seven (137) people responded to online questionnaires. Sixty-four (46.72%) respondents were female versus 73 (53.28%) Male. Participants ranged in age from 12 to 50, with an average age of 28. In male subjects, the average age was 30 years and 27 years for females. The median age for both sexes was 29 years, with a 34-year-old mode. The majority of respondents were from the city of Douala (23) and Yaounde (56) metropolitan cities of Cameroon (Table 1). Regarding the level of education, 87.59% were at university level, 11.68% were from secondary school and 0.73% said they had no level.

**Internet users' knowledge of COVID-19:** The majority of participants admitted that they had heard of COVID-19, 97.08% versus 02.92% who said they had not heard of it. Out of 137 respondents, 135 (98.54%) listed all of the symptoms observed in a suspected case of COVID-19. Respondents' knowledge is varied and multiple (Table 2), however, the largest proportion (31.85%) reported that a suspected case of COVID-19 has both fever, cough, shortness of breath, runny nose, headache and insomnia; 12.59% reported fever, cough, shortness of breath and runny nose; 9.63% reported fever, cough, shortness of breath, headache and 8.89% reported fever, cough; runny nose, headache. One hundred and seventeen subjects, (85.40%) knew that the incubation period of COVID-19 is 3 to 14 days, only 0.73% (01) thought that this period is less than 03 days and 13.87% (19) that

**Table 1. Breakdown of respondents by city of residence**

City of residence	Number	%
Bafang	01	0.73%
Bafoussam	03	2.19%
Bandjoun	01	0.73%
Bertoua	05	3.65%
Douala	23	16.79%
Dschang	02	1.46%
Ebolowa	13	9.49%
Edea	01	0.73%
Foumban	01	0.73%
Garoua	02	1.46%
Garoua-Boulai	02	1.46%
Kousseri	01	0.73%
Kribi	01	0.73%
Kumba	01	0.73%
Limbe	01	0.73%
Maroua	16	11.68%
Mbalmayo	01	0.73%
Mokolo	02	1.46%
NKonsamba	01	0.73%
Obala	02	1.46%
Sangmelima	01	0.73%
Yaoundé	56	40.88%
Total	137	100.00%

it is greater than 14 days. The majority of Internet users, 88.32% (121) know that people with COVID-19 can be cured compared to 11.68% who say that the disease cannot be cured. Similarly, a large proportion of Internet users, including 132 (96.35%) knew that there is not yet a vaccine to prevent COVID-19 at this time of study, compared to 3.65% who thought otherwise (05). The majority of people thought that the disease at COVID-19 is not a subject of witchcraft, 97.81% against a minority (02.19%). Although the large proportion of Internet users rejected rumours that COVID-19 had been invented by the White Race in order to decimate the African black race, nevertheless a significant minority (30.66%) thought it was an invention by the White Race to decimate the African black race. Similarly, 87.59% (120) respondents thought that COVID-19 would be a curse of the gods, compared to a minority of 12.41% who thought otherwise (17). Only 2.92% (04) knew at least one person infected with COVID-19 in their rounds. Almost 45.99% (63) of respondents thought that their environment did not pose a risk of COVID-19 contamination, while 54.01% thought their environment was a risk factor for COVID-19. Similarly, the largest proportion of respondents (62.77%) reported that at least one case of COVID-19 had already been reported in their cities of residence and 51 (37.32%) stated that no cases of COVID-19 had been reported in their cities. Of all respondents, 48.91% were aware that older adults were one of the most vulnerable social strata to COVID-19 and therefore had a higher risk of contracting the disease (Table 2). Regarding The Internet users' knowledge of COVID-19 prevention methods, the survey showed that only 30.65% (42/137) cited five correct and combined methods for the prevention of COVID-19, compared to 69.34% (94/137) who mentioned that "not sharing meals with other people" is a method of prevention. The prevention measures most cited by Internet users were: 95.62% (131) Avoiding gatherings; 89.05% (122) stay confined to your home; 85.40% (117) clean them but with a hydro-alcoholic solution; 83.21% (114) washing hands; 54.05% (73) wearing masks.

**Internet user's practices towards COVID-19:** Internet users cited the use of several combination methods to prevent COVID-19 (Table 2). The largest proportion (30.66%) Internet users reported washing their hands, wearing a surgical mask, avoiding gatherings, staying confined to their homes, cleaning their hands with a hydro-alcoholic solution; 16.79% reported washing hands, avoiding gathering, staying confined at home, cleaning hands with a hydro-alcoholic solution and 10.95% washing hands, wearing a surgical mask, avoiding gathering, staying confined at home, cleaning hands with a hydro-alcoholic solution; Do not share meals with other people.

**Internet users' attitudes towards COVID-19:** Only 31.38% (42/137) of Internet users confirmed that they had observed at least

**Table 2. Distribution of respondents based on reporting of a suspected case of COVID-19 and mode of prevention**

Symptoms of corona virus included (Covid-19)	Number	%	%IC 95	
Diarrhea, shortness of breath, insomnia;	01	00.74%	00.02%	4.06%
Diarrhea, cough, shortness of breath, insomnia;	01	00.74%	0.02%	4.06%
runny nose	01	00.74%	0.02%	4.06%
Fever;	01	00.74%	0.02%	4.06%
Fever, diarrhea, shortness of breath, headache;	01	00.74%	0.02%	4.06%
Fever, diarrhea, cough;	01	00.74%	0.02%	4.06%
Fever, diarrhea, cough; runny nose	01	00.74%	0.02%	4.06%
Fever, diarrhea, cough, runny nose, headache;	03	02.22%	0.46%	6.36%
Fever, diarrhea, cough, shortness of breath, runny nose;	04	02.96%	0.81%	7.41%
Fever, diarrhea, cough, shortness of breath, runny nose, headache;	07	05.19%	2.11%	10.39%
Fever, diarrhea, cough, shortness of breath, headache;	04	02.96%	0.81%	7.41%
Fever, runny nose, headache;	01	00.74%	0.02%	4.06%
Fever, shortness of breath, runny nose, headache, insomnia;	01	00.74%	0.02%	4.06%
Fever, Headache;	01	00.74%	0.02%	4.06%
Fever, cough;	02	01.48%	0.18%	5.25%
Fever, cough, runny nose;	03	02.22%	0.46%	6.36%
Fever, cough, runny nose, headache;	12	08.89%	4.68%	15.01%
Fever, cough, shortness of breath;	05	03.70%	1.21%	8.43%
Fever, cough, shortness of breath, runny nose;	17	12.59%	7.51%	19.39%
Fever, cough, shortness of breath, runny nose, headache;	43	31.85%	24.10%	40.42%
Fever, cough; shortness of breath, runny nose, headache, insomnia;	01	00.74%	0.02%	4.06%
Fever, cough, shortness of breath, headache;	13	09.63%	5.23%	15.90%
Fever, cough, headache;	04	02.96%	0.81%	7.41%
Insomnia;	01	00.74%	0.02%	4.06%
Don't know.	03	02.22%	0.46%	6.36%
Cough, runny nose, headache;	02	01.48%	0.18%	5.25%
Coughing, shortness of breath, headache;	01	00.74%	0.02%	4.06%
Total	135	100.00%		
How do you protect yourself from coronavirus?				
Avoid gathering, stay confined to your home, clean your hands with a hydro-alcoholic solution;	09	06.57%	03.05%	12.10%
Avoid gathering, stay confined to your home, wash your hands with a hydro-alcoholic solution, do not share meals with other people;	03	02.19%	00.45%	06.27%
Avoid gathering, clean hands with a hydro-alcoholic solution;	01	00.73%	00.02%	04.00%
Wear a surgical mask, avoid gathering, stay confined to your home/clean hands with a hydro-alcoholic solution;	05	03.65%	01.20%	08.31%
Wear a surgical mask, avoid gathering, stay confined to your home, clean your hands with a hydro-alcoholic solution, do not share meals with other people;	03	02.19%	00.45%	06.27%
Wear a surgical mask, clean your hands with a hydro-alcoholic solution;	01	00.73%	00.02%	04.00%
stay confined to your home;	01	00.73%	00.02%	04.00%
Wash your hands, avoid gathering;	01	00.73%	00.02%	04.00%
Wash your hands, avoid gathering, do not share meals with other people;	01	00.73%	00.02%	04.00%
Washing your hands, avoiding gathering, staying confined to your home;	08	05.84%	02.55%	11.18%
Wash your hands, avoid gathering, stay confined to your home, clean your hands with a hydro-alcoholic solution;	23	16.79%	10.95%	24.12%
Wash your hands, avoid gathering, stay confined to your home, clean your hands with a hydro-alcoholic solution, do not share meals with other people;	06	04.38%	01.62%	09.29%
Wash your hands, avoid gathering, clean your hands with a hydro-alcoholic solution;	04	02.92%	00.80%	07.31%
Wash your hands, avoid gathering/ Clean hands with hydro-alcoholic solution, Do not share meals with other people;	04	02.92%	00.80%	07.31%
Wash your hands, wear a surgical mask, avoid gathering;	01	00.73%	00.02%	04.00%
Wash your hands, wear a surgical mask, avoid gathering, stay confined to your home;	05	03.65%	01.20%	08.31%
Washing your hands, wearing a surgical mask, avoiding gathering, staying confined to your home, cleaning your hands with a hydro-alcoholic solution;	42	30.66%	23.07%	39.10%
Wash your hands, wear a surgical mask, avoid gathering, stay confined to your home, clean your hands with a hydro-alcoholic solution, do not share meals with other people;	15	10.95%	06.26%	17.42%
Washing your hands, wearing a surgical mask, don't share meals with other people;	01	0.73%	00.02%	04.00%
Washing your hands, wearing a surgical mask, cleaning your hands with a hydro-alcoholic solution;	01	0.73%	00.02%	04.00%
Washing your hands, staying confined to your home;	02	1.46%	00.18%	05.17%
Total	137	100.00%		
Who are the most vulnerable to COVID-19				
Children	02	1.46%	00.18%	05.17%
Don't know	12	8.76%	04.61%	14.80%
people of 3rd age	67	48.91%	40.27%	57.58%
seniors/children	04	2.92%	00.80%	07.31%
3rd age/children/pregnant women	21	15.33%	09.75%	22.47%
3rd age/pregnant women	08	5.84%	02.55%	11.18%

government-issued barrier measures. The barrier measures cited by Internet users were among other things (Table 3): 88.32% (121/137) containment and exit just when necessary; 87.59% (120/137) avoid crowds of 10 to 50 people; 85.40% (117/137) wash their hands regularly; 83.94% (115/137) cover their mouths with the bend of

the elbow when sneezing or coughing; and 80.29% (110/137) regularly use a hydro-alcoholic gel. On the other hand, 2.19%; 1.46% and 0.73% of Internet users said they would continue to party with friends, respectively; travel from city to city and continue to attend meetings of more than 30 to 50 people.

**Table 3. Practices, sources of information and observation of barrier measures by Internet users**

Practices and source of information	Number	%
<b>Practices and Observing Barrier Measures</b>		
I wash my hands regularly	117	85.40%
I regularly use the hydro-alcoholic solution to clean my hands	110	80.29%
I use a protective mask/ Nose mask	62	45.26%
I'm in lockdown, I just go out when I need to something important	121	88.32%
I cover my mouth with the elbow when sneezing or coughing	115	83.94%
I avoid crowds of more than 10-50 people	120	87.59%
I'm still partying with friends	03	02.19%
I continue to travel from city to city	02	01.46%
I continue to participate in meetings of more than 30-50 people	01	00.73%
<b>Sources of information on COVID-19</b>		
Radio	57	41.61%
Tv	101	73.72%
Internet (excluding social medias)	112	81.75%
Sms	57	41.61%
Posters	34	24.82%
ear to mouth	32	23.36%
Social medias	97	70.80%

Practices and observing barrier measures

**Sources of information about COVID-19:** Regarding the source of information (Table 3) on COVID-19, the majority of Internet users reported derived their information and knowledge about COVID-19 on the internet (81.75%); on television (73.72%); in social networks (70.80%); on radio (41.61%).

## DISCUSSION

The majority of respondents were young people, the average age of respondents was 28 years, this result is similar to that of the study carried out on about 100 Internet users in Morocco (L. Okhaya, 2020) on social networks in the age of Covid 19 when the majority of respondents were young (6). Another KAP study conducted in the Southwestern region of Cameroon in March (10 to 18) 2020 conducted by Tendongfor N. and colleagues, among the population also showed a high participation of young people (between 20 and 29 years). Youth participation is almost identical in our respective studies, with the only difference that the data were collected from households and at the level of social networks (7). One could say that the majority of users of social networks (Facebook, WhatsApp, Twitter, etc.) are young people by approximation to new technologies. Most respondents had a university level (87.59%) and 97.08% of these respondents had already heard of COVID 19. This result is similar to studies conducted by Ngoyi et al., (2020) and Ngwewondo et al., (2020) respectively in the Democratic Republic of Congo and Cameroon on SARS-COV-2 knowledge, attitudes and practices (COVID-19). In the DRC, 91.6% of respondents (students) had a good knowledge of the disease and in Cameroon 94.3% knew that the virus was transmitted by saliva droplets from an infected person (8.9). The level of education obtained is almost identical to that of Tendongfor in his study, where most respondents had a university level (55.6%) (7). This good knowledge could be justified by the fact that there has been a strong awareness and communication in the turn of COVID-19 since the spread of the virus. The sources of information were varied mainly Internet (excluding social networks) of which 81.75%, this can be justified by the fact that the target of the study was Internet users. Our study showed that most respondents (88.32%) knew that this disease can be cured and 85.40% know the incubation period of the disease. This result was demonstrated by Tendongfor, whose study participants had testified that they had been informed of the disease through channels such as television (64.2%) and social networks (38.8%) (7). Given the diversity of information sources cited by Internet users, it is important to use any possible means of awareness to reach different age groups. This data also demonstrates that social

networks are a significant channel for the transmission of the necessary information about health events. The majority of people thought that the disease at COVID-19 is not a subject of witchcraft, that is, 97.81%. Despite this knowledge, 87.59% of respondents thought that COVID-19 would be a curse of the gods and a significant minority (30.66%) thought it was an invention by the White Race to decimate the African black race. According to the theory of control of freedom, still known as the theory of psychological reactance (Brehm and Brehm, 1981), individuals feel free to choose between several alternatives and engage in behaviours where they can secure their freedom (8). The results of an exploratory study conducted in Cameroon by RC Nga, (2020) showed that an individual's cultural identity integrates his ethnicity, religion, traditions and beliefs (9). Regarding the prevention methods of COVID19, only 30.65% (42/137) cited five correct and combined methods for the prevention of COVID-19, while 31.38% (42/137) of Internet users confirmed observing at least six government-issued barrier measures. There is a poor practice of prevention measures, in this study cited above, the results explain the refusal of the intended targets to adopt the rules enacted by their desire to preserve their personal identity (RC Nga, 2020). It is therefore necessary to change the public's perception of COVID 19 and lead them to adopt attitudes to protect themselves and save lives.

## Conclusion

This online survey found that in phase 1 of the COVID-19 epidemic in Cameroon, the majority of Internet users were aware of the symptoms of COVID-19. It is noted that a significant proportion had uncentered beliefs about the origin of COVID-19, such as a curse, an invention designed to decimate the African black race. We observed a small proportion of the knowledge and practice of prevention at COVID 19 by Internet users. The most accessible sources of information by respondents were the internet, television, social networks and radio. We recommend increasing awareness and communication on behavioural change in the prevention of COVID-19. To strengthen information on the origin of COVID-19 among the population.

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**Authors' contribution:** BAIG conceptualized the study, collected, analyzed and interpreted the data and wrote the manuscript; DDNR, discussed the results and revised the manuscript; CBA conceptualized the study, analyzed and interpreted the data and discussed and revised the manuscript; ANA, analyzed and interpreted the data discussed the results and revised the manuscript.

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