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Knowledge, Attitudes, and Practice of Cameroonians towards Governmental Measures against COVID-19, Cameroon: An Online Survey

Basil Kum Meh[1,2], Franklin Chu Buh[1,3*], Rose Sangong Efeutmecheh[4], Idriss Fotso[4], Moubarak Ben Halid Tinsobad[5] and Ferdinand Tingomd[5]

[1]Department of Zoology and Animal Physiology, University of Buea, Buea, Cameroon.
[2]Department of Allied Health Biaka University Institute of Buea, Buea, Cameroon.
[3]Panafrican Hospital Center-GSA/CNPS, Douala, Cameroon.
[4]University of Dschang, Dschang, Cameroon.
[5]University of Buea, Buea, Cameroon.

Authors' contributions

This work was carried out in collaboration among all authors. All authors contributed to the development of the different sections of the questionnaire used. Author MBHT created the google form questionnaire. Authors FCB and TBHM wrote the Background to the study, authors RSE and IF worked on the methodology, Author FT analyzed the data collected. Author BKM interpreted the results. Authors FCB and BMK discussed the results. Authors RES, FCB, BMK, and IF, proofread the work. All authors read and approved the final manuscript.

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ABSTRACT

Background: The outbreak of the COVID-19 epidemic left no nation indifferent in adopting measures to fight against the spread of the disease. This survey aimed at assessing the knowledge, attitude, and practice of Cameroonians towards preventive measures against the spread of COVID-19 in Cameroon.
Methodology: It was a cross-sectional online survey conducted nationwide via self-administration of a google form questionnaire in March 2020. Questionnaires were shared via Facebook and WhatsApp. Being a Cameroonian based in Cameroon was the main inclusion criteria. Data were analyzed using SPSS software.

**Corresponding author: Email: franklinbuhchu@gmail.com;*

Results: Amongst the 444 respondents who completed the survey, 232(52.3%) were males and females 212 (47.7%) with the majority, 221 (49.8%) between the ages of 26 to 35. Most, (99.6%) respondents had heard of COVID-19 mainly via social media 244 (55.0%) and TV/Radio, 139(31.3%). Difficulty in breathing was the most known symptom 402(90.54%). Cameroonians are quite knowledgeable about COVID-19 (444/446 i.e. 99.6% of respondents). Less than a half, 174 (39.19%) were aware of; 13 preventive measures and over 384 (86.49%) of 7 additional measures. More than half of the participants 261(58.8%) were optimistic that the pandemic will stop if people respect the hygienic and governmental preventive measures. A majority, 91% affirmed practicing handwashingbut only 76(19.3%) did it properly. Participants demonstrated less compliance to social distancing, 230(51.8%). A significant relationship was noted between knowledge on COVID-19 and handwashing with soap (p=0.005; r=0.320) as well as the use of face masks (r=0.701, p=0.001).

Conclusion: The governmental measures and hygienic preventive measures are known to Cameroonians but the compliance to these measures is moderate.

Keywords: COVID-19, knowledge, attitudes, governmental measures, Cameroon.

1. INTRODUCTION

According to the World Health Organization [1], the novel Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which is of the same family as SARS-CoV-1, which caused the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003, all isolated from bats [2,3,4]. These viruses come from the virus family 'Coronaviradae' recognized in 1968 and named as such because their viral structure and intracellular budding sites differentiated them from other RNA viruses [5]. COVID-19 is one of the emerging infections in recent decades resulting in major outbreaks with significant public health and economic impacts [6]. The virus is transmitted from human to human via droplets coughed or exhaled by infected persons and by touching droplet-contaminated surfaces or objects and then touching the eyes, nose, or mouth [7-9]. The disease is a highly contagious disease with fever, dry cough, fatigue, myalgia, and dyspnea as major clinical manifestations [10,3,11]. The first human cases of COVID-19, the disease caused by the novel coronavirus, subsequently named SARS-CoV-2, were first reported by officials in Wuhan City, China, in December 2019 [8,12]. The World Health Organization (WHO) declared the 2019–20 coronavirus outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 [13] and a pandemic on 11 March 2020 [14]. Most people infected with the COVID-19 virus experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illnesses [14].

As of now, diagnosis of COVID-19 is based on detection of unique sequences of virus RNA by real-time reverse-transcription-polymerase chain reaction (rRT-PCR) appropriate for the acute phase of illness [4]. However, serologic tests also exist; antibodies detected are mainly divided into IgM and IgG. In general, most SARS-CoV-2 specific IgM antibodies were positive after 3-5 days of onset, and the recovery period of IgG antibody titers was 4 times or higher than that of the acute phase. The CDC holds that antibody testing should not be used as the sole basis to diagnose or exclude infection [15,4]. Another diagnostic test used is the Rapid antigen test. In theory, rapid antigen tests have advantages of fast detection speed and low cost but have poor sensitivity and specificity for detecting coronavirus except for MERS as yet [16,4]. As lung abnormalities may appear ahead of clinical manifestations and Nucleic Acid Amplification Test (NAAT), some studies have recommended early chest computerized tomography (CT) for screening suspected patients with COVID-19 [17-19]. Currently, there are no definitive and specific treatment regimens against COVID-19 [20]. Treatment, therefore, relies on strategies including early diagnosis, timely reporting, isolation, and supportive treatments as well practicing the preventive measures (regular and thorough cleaning of hands with soap and running water or use alcohol-based hand sanitizers, maintaining social distancing, avoiding crowded places, avoiding touching the mouth, nose, and eyes amongst many others) as an important line of actions against COVID-19 infections [14,21] (WHO, 2020; CDC, 2020). As

of now, the main therapies being used to treat the disease are antiviral drugs, chloroquine/hydroxychloroquine, and respiratory therapy [22]. As the pandemic spread across the globe, more and more countries have been forced to adopt strict measures to fight coronavirus from closing down borders to more drastic measures like confining the populations [23]. Cameroon, like many States in the world, Cameroon is not spared by this pandemic. From the very first hours of its emergence, the Government implemented a prevention and response plan aimed at stemming the spread of this epidemic [24]. The first case was confirmed on 24 February 2020, and today, over 8 000 individuals have been tested positive [25,26].

As said Geldsetzer *et al.,* (2020), human behavior is influenced by people's knowledge and perceptions [27]. We, therefore, had as objective to investigate the effects of the 13 governmental measures on the fight against COVID-19 and the latter 7 additional measures on Cameroonians living in Cameroon. Evaluating the knowledge, perception, and compliance of the population to governmental measures would bring health authorities into understanding the reality in the field thus help in constructive decision making in the fight against COVID-19. The aim of this study was therefore to assess the knowledge, attitude, and practice of Cameroonians towards Governmental measures against the spread of COVID-19 in Cameroon.

2. METHODS AND MATERIALS

2.1 Research Design and Data Collection

The study adopted survey research which allowed for the collection of data across the national territory using an online form. It was a cross-sectional online survey conducted nationwide via self-administration of a Google form questionnaire from the 7th to the 21st of March 2020. Cameroonians of 15 years and above, residing in the national territory from the time the pandemic started in Cameroon to the time of the study were eligible to participate.

A standardized online internet questionnaire was produced in the two official languages (French and English). This questionnaire comprised four sections: data on the socio-demographic characteristics of participants; the awareness of COVID-19 in general and in particular the awareness of the 20 measures put in place by the Government of Cameroon as a response plan against the spread of COVID-19 as well as some WHO preventive strategies; the attitude and practice of Cameroonians towards the aforementioned governmental measures and finally the compliance of Cameroonians to these measures. The link was sent to social media platforms including WhatsApp, Twitter, and Facebook for participants to fill out and submit. The link was shared to Facebook platforms that had thousands of Cameroonians and to various WhatsApp groups.

The instruments for data collection were assessed in terms of validity and reliability to ensure quality. Face and content validity was ensured by establishing a logical link between questionnaire constructs and the research objectives and expert reviews on the ability and aptness of items of the instruments. This ensured that the test items on the questionnaire should elicit the right responses.

The purpose of this study, study objectives, and what was expected from the participants were clearly stated in the introductory part of the questionnaire. Also, important instructions were stated in these questionnaires with regards to the fact that participants were not supposed to submit this questionnaire more than one time; this was to limit the bias of duplicates responses. Also, respondents were asked not to share their answers with friends or colleagues. The filled and submitted versions were received on an online server by the I.T technician. The English and French versions were merged.

2.2 Data Analyses

Questionnaire data was analyzed using the IBM Statistical Package for Social Science (SPSS) version 25 and Microsoft excel. Descriptive statistics which involve collecting, summarizing, and presenting data using frequency and percentages were employed inferential tool used was the correlation to establish the relationship between knowledge of COVID-19 and some preventive measures.

3. RESULTS AND DISCUSSION

3.1 Results

This study included 446 participants amongst which, 232(52.3%) were males and 212 (47.7%) were females giving a sex ratio of 1:1. The most represented age group was 26-35.

3.1.1 Demographic characteristics of participants

From Table 1, 446 individuals from all regions of Cameroon participated in the online survey. The study participants constituted 232(52.3%) males and females 212 (47.7%). Among which majority 221 (49.8%) were between the ages of 26 to 35 and the least represented constituted those 60 years and above. With regards to educational qualification, most of the respondents, 151 (34.0%) were Bachelor's Degree holders and only 7 (1.6%) and 25 (5.6%) for CAPIEM and Ph.D. holders respectively. Slightly more than half, 252 (56.8%) were single. More than a quarter of the participants, 143 (32.2%) were from the North West and the least represented regions were East, South, and the Extreme North representing less than 5% of the participants. Nurses were the most represented profession, 91 (20.5%).

3.1.2 Awareness of Cameroonians on COVID-19 and preventive measures by the Cameroon Government

As seen in Table 2, almost all, 444 (99.6%) of participants argreed to have heard about COVID-19 while only 2 (0.4%) indicated that they have never heard of COVID-19 and, as such, were dropped from the analysis. This gave the study an actual sample of 444 participants. Social media, 244 (55.0%) and TV/Radio, 139 (31.3%) were the main means by which participants were first informed of COVID-19.

Majority of the participants indicated that the Cameroon government had instituted about 13 preventive measures to limit the spread of the COVID-19, 174 (39.19%), more than ¾ of the participants were aware of the recent additional measures taken by the Cameroon government to combat COVID-19, 384 (86.49%). Amongst those who knew about the new measures, about 98.87% mentioned the systematic wearing of face masks in all public places. Meanwhile, almost a quarter 109 (24.55%) had no idea about the number of preventive measures set by the Cameroon government to limit the spread of the pandemic. Difficulty in breathing amasses the most represented symptom, according to 402(90.54%) of the respondents, followed by fever, cough, running nostrils, itching throat, headache, and painful muscles, respectively. With regards to hygienic measures, disinfecting the surroundings and any working tools appeared the highest, 267 (23.16%) among respondents; followed by hand washing with soap and running water or using alcohol-based hand sanitizer, 222(19.25%), others were respecting social distances and wearing of hand globes.

3.1.3 Attitude adopted by Cameroonians towards the different preventive measures put in place by the Government to limit the spread of COVID-19

Evident from Table 4, majority of the respondents, 425(95.72%) regarded COVID-19 to be a viral infection that can infect everyone. An insignificant proportion of 10(2.25) considered it as a White man's disease while only 9(2.03%) doubt its existence.

As shown in Table 4, less than half of the participants 194(43.7%) mentioned that COVID-19 is transmitted mostly from person to person, 210(47.3%) mentioned via eating contaminated food, and only 22 (4.95%) mentioned droplets of an infected person to an uninfected person through sneezing. A great proportion of the respondents 408/444 (91.9%) affirmed that the most efficient way to limit the spread of COVID-19 was by respecting hygienic measures and social distancing. While 7(1.6%) believed that the spread can only be limited through prayers and fasting, in line with the 7(1.60) who believes the pandemic is a sign of end-time, However, more than half, 261(58.8%) were optimistic that the pandemic will one-day stop if people respect hygienic measures and all the governmental preventive measures.

Table 5, An evaluation of whether the governmental measures taken so far are sufficient enough to stop the spread of the COVID-19 in Cameroon, recorded that 149(33.56%) think the measures are not sufficient unless additional measures such as total confinement in all affected regions travel bans from affected zones to none affected zones are implemented, 99(22.3%) of them mentioned that unless the government provides face mask and hydro-alcoholic solution to the population and food provisions, the government measures would not be effective. To about 40(9.0%) of respondents, more testing should be done.

Table 1. Demographic Characteristics of Participants

		Number (n)	Percentage (%)
Gender	Male	232	52.3
	Female	212	47.7
	Total	**444**	**100.0**
Age	18 to 25	144	32.4
	26 to 35	221	49.8
	36 to 44	55	12.4
	45 to 55	15	3.4
	56 to 60	6	1.4
	60+	3	0.7
	Total	**444**	**100.0**
Level of Education	Ordinary Level	14	3.2
	CAPIEMP	7	1.6
	Others	35	7.9
	Advance Level	46	10.4
	HND	28	6.3
	Bachelor's Degree	151	34.0
	Master's Degree	138	31.1
	PhD.	25	5.6
	Total	**444**	**100.0**
Marital Status	Single	252	56.8
	Married	149	33.6
	Widow	43	9.7
	Total	**444**	**100.0**
Region of Origin	Northwest	143	32.2
	Southwest	106	23.9
	West	130	29.3
	Littoral	28	6.3
	Central	28	6.3
	East	4	0.9
	South	3	0.7
	Extreme North	2	0.5
	Total	**444**	**100.0**
Profession	Student	86	19.4
	Teacher	72	16.2
	Nurse	91	20.5
	Epidemiologist	33	7.4
	Humanitarian worker	32	7.2
	Medical laboratory technician	31	7.0
	Medical doctor	18	4.1
	Others	81	18.2
	Total	**444**	**100.0**

Table 2. Respondents' knowledge about COVID-19 and awareness of Governmental preventive measures

Question	Response	Frequency (n)	Percentage (%)
Have you heard of the new Corona Virus (COVID19)?	Yes	444	99.6
	No	2	0.4
	Total	**446**	**100.0%**
Where did you First hear about COVID19?	Social media	244	55.0
	TV/Radio	139	31.3
	Health Professionals	39	8.8

	Government communication	14	3.2
	Friends/Neighbors	8	1.8
	Total	**444**	**100.0%**
Where the COVID19 was first discovered?	China	442	99.5
	Cameroon	2	0.5
	Total	**444**	**100.0%**
The number of preventive measures put in place by the Cameroon government to limit the spread of COVID-19	10	1	0.23
	13	174	39.19
	14	69	15.54
	16	15	3.38
	18	15	3.38
	20	61	13.74
	No Idea	109	24.55
	Total	**444**	**100.0%**
Knowledge of recent additional measures taken by the Cameroon Government	Yes	384	86.49
	No	60	13.51
	Total	**444**	**100.00**
	Systematic wearing of masks in all public places	439	98.87
	Total confinement	5	1.13
	Total	**444**	**100.00**

Table 3. Assessing Respondents Knowledge on Symptoms and preventive hygienic measures Against of COVID 19

Options	Frequency (n)	Per R	Per part	Rank
Fever	392	16.11	88.29	2
Cough	392	16.11	88.29	3
Sore throat (Itching throat)	289	11.88	65.09	5
Headache	247	10.15	55.63	6
Running nostrils	299	12.29	67.34	4
Painful muscles	194	7.97	43.69	8
Difficulty breathing	402	16.52	90.54	1
Sneezing	218	8.96	49.10	7
Wearing of hand gloves	221	19.17	49.77	3
Disinfect your surroundings and any working tools	267	23.16	60.14	1
Washing hands with soap and running water or using alcohol based hand sanitizer	222	19.25	50.00	2
Maintaining social distance of at least 1.5m in public	187	16.22	42.12	5
Take Enough Alcohol	65	5.64	14.64	6
Drink Warm Water, eat garlic and ginger	191	16.57	43.02	4

Table 4. Respondents Views about COVID-19 transmission and measures of stopping its spread

Options	Frequency (n)	Percentages (%)
It's a viral infection that can infect everyone	425	95.72
It's the White man's disease	10	2.25
It doesn't exist	9	2.03
Total	**444**	**100.0%**
Respondents Views on how COVID-19 transmission		
Transmitted Mostly from Person to Person	194	43.69%
Eating Contaminated Food	210	47.30%
Droplets of An Infected Person to an Uninfected Person	22	4.95

Options	Frequency (n)	Percentages (%)
droplet infection (sneezing)		
Through Contaminated Injections or Blood Transfusion	6	1.35%
Touching the Face	12	2.70%
The most efficient way to limits the spread of COVID-19		
By respecting hygienic measures and social distancing	408	91.9
Only through prayers and fasting	7	1.6
Man can't be protected from COVID-19.	5	1.1
No Opinion	24	5.4
Total	**444**	**100%**
How the spread of COVID-19 can be stopped in Cameroon		
Yes, by respecting hygienic measures and all the governmental preventive measures	261	58.8
No, all Cameroonians will be killed by COVID-19	10	2.3
Yes, by not talking to anyone at home or in public	166	37.4
No, it's the end time as some Christians believe.	7	1.6
Total	**444**	**100%**
Will the spread of COVID-19 stop someday in Cameroon?		
Yes, by respecting hygienic measures and all the governmental preventive measures	261	58.8
No, all Cameroonians will be killed by COVID-19	10	2.3
Yes, by not talking to anyone at home or in public	166	37.4
No, it's the end time as some Christian's belief.	7	1.6
Total	**444**	**100%**

Table 5. Respondents views effectiveness of Governmental Measures to stop the spread of the COVID-19 in Cameroon

Options	Frequency (n)	Percentage (%)
No, unless the government add other measures like total confinement in all affected regions, travel bans from affected zones to none affected zones	149	33.56
Unless the government provides face mask and hydro-alcoholic solution to the population and food provisions	99	22.30
Yes, if the measures already put by the government are followed up and respected	23	5.18
If the government should carry out more testing to know the real status of the nation	40	9.01
If the government can reinforce the measures put in place and also assist the population especially reduction of fuel prices to reduce transportation cost so as to ease measures to be respected by transporters	7	1.58
Mass testing	30	6.76
Yes, if the measures already put by the government are followed up and respected	82	18.47
Others	14	3.15
Total	**444**	**100.0%**

3.1.4 Compliance of Cameroonians to barrier measures and governmental measures against COVID-19

As shown on Table 6, A great proportion of the respondents admitted that they practice hand washing 405/444(91.2%) against a few who refused 16/444 (3.6%). Among those who practice hand washing, about 124/405 (30.6%) washed their hands often with running water, while only 76(19.3) did proper handwashing by washing their hands with soap and running water for at least 20 seconds concentrating on the thumbs and fingernails while others ensure that when in the market they always use hand sanitizer to protect their hands. Meanwhile, those

who do not practice handwashing gave varied reasons such as, lack of water and soap all the time because of too much water cut in our society alongside electricity shortage. Lack of money to get a hand sanitizer 20(4. 5%). Moreover, a few believe hand-washing alone cannot stop the spread of the virus since it is a respiratory virus.

Almost all the respondents 403(90.77%) admitted that they regularly make use of facemasks when going out of their homes against a few 41 (9.23).

Concerning social distancing, majority of the respondents do not respect social distancing, 230(51.8%) whereas 214 (48.2%) agreed that they practice social distancing.

3.1.5 The spearman correlation between knowledge of covid-19 and preventive measures

Table 7 establishes the relationship between the knowledge of COVID-19 and Preventive measures. There was a semi-strong insignificant positive relationship between knowledge of COVID-19 and the use of hand sanitizer ($r=0.406$, $p=0.097$) as well as handwashing with soap and running water ($p=0.005$). There was therefore no statistical barking that the use of hand sanitizers or handwashing among Cameroonians increased as their knowledge on COVID-19 increased. However, there was a strong positive significant relationship between knowledge of COVID 19 and the use of face masks ($r=0.701$, $p=0.001$).

Table 6. Compliance of participants to preventive measures of handwashing and wearing of face masks

Questions	Options	Frequency (n)	Percentage (%)
Hand washing	Yes	405	91.2
	No	16	3.6
	Total	**444**	**100.0%**
If YES, how do you practice hand washing	I wash my hands often with running water and soap	124	30.6
	I use an alcohol based hand sanitizer as many times as possible	160	39.5
	When I am at the market, I always use hand sanitizer to protect my hands.	1	0.3
	I wash my hands with soap and running water for at least 20 seconds concentrating on my thumbs and my fingernails	75	18.5
	None response	45	11.1
	Total	**405**	**100.0%**
If NO, why?	Because I do not have water and soap all the times	4	25
	Too much water cut in our society	1	6
	No lights, No Running Water.	1	6
	I do not have money to get a hand sanitizer	6	37.5
	Hand washing alone cannot stop the spread of this pandemic.	1	6
	I don't believe hand washing prevents us from COVID-19 since it is a respiratory virus	2	13.5
	If I do not touch or greet anyone then I cannot be contaminated	1	6
	Total	**16**	**100**
Have you been recently regularly using face masks when going out of your home?	Yes	403	90.77
	No	41	9.23
The practice of social distancing	Yes	214	48.2
	No	230	51.8

Table 7. The Spearman Correlation between knowledge of COVID-19 and Preventive measures

Spearman Correlation	Knowledge of Corona Virus (COVID-19)	Knowledge of Corona Virus (COVID-19)	Knowledge of Corona Virus (COVID-19)
Use of Hand sanitizer	r=0.406, p=0.097		
Handwashing with soap		r=0.320*, p=0.005	
Face masks			r=0.701*, p=0.001

**. Correlation is significant at the 0.001*

4. DISCUSSION

The findings of this study could be used to set priorities in the battle against COVID-19 by public health authorities and the media. The results will equally let the decision-makers know the area of focus of their actions since they would from this study be informed of the ups and downs of the population towards COVID-19 measures and possible reasons why they do not adhere to certain preventive measures. This will help the Government to set a new but specific response plan against the pandemic.

From our results, Cameroonians are quite aware of the existence of COVID-19 (444/446 i.e. 99.6% of respondents). This is in line with the results of a study by Wolf *et al.,* (2020) in the USA, where all the participants have at least heard about COVID-19 [28], and the study by Akwa and collaborators in Cameroon, where majority were aware of COVID-19 [12]. However, the result was higher than that obtained by Zhong and collaborators in China, early 2020 in which the awareness on COVID-19 was rated 90% among Chinese residents [3]. This difference may be related to the time difference in the two studies since information about the virus kept rising with the progression of the pandemic. Further, the main source of information was via social media (55%) and TV/Radio (31.3%). This result is a new finding in Cameroon as no other study was found with similar information. Concerning knowledge on the symptoms of COVID-19, respondents were quite aware; difficulty in breathing amass the highest, according to 402(90.54%) of the respondents, followed by fever, 392(88.29%), cough 392(88.29%), running nostrils 299(67.34%), sore throat (itching throat) 289(65.09%), headache 247(55.63%), sneezing 218(49.10%) and painful muscles 194(43.69%). This was similar to the results obtained by Geldsetzer (2020) in the USA where he confirmed the majority of the respondents knew the main symptoms of the pandemic [27]. It was also under the results obtained by Zhong and collaborators in China (Zhong *et al.,* 2020) who found that fever, dry cough; fatigue, myalgia, and dyspnea were the main symptoms of the disease [3]. These results show that Cameroonians are more concerned about their health and adopt an information-seeking attitude to stay healthy.

With respect to the awareness of Cameroon's government adopted measures against the spread of COVID-19, not up to half of the respondents, 174 (39.19%) were aware that the government of Cameroon released 13 measures. While a fewer number, 61(13.74%) confirmed the Cameroon government so far have put in place 20 measures to fight against the rapid spread of the pandemic. This show that quite a good number of Cameroonians were not informed of additional 07 measures taken by the government amongst which was the systemic wearing of face mask in all public places. Although some Cameroonians knew the government put in place measures to combat the spread of the pandemic, a significant proportion were not aware of the number of measures put in place and by essence were not aware of the content of the measures. This might constitute a serious problem in the fight against the pandemic as ignorance of these measures could promote the spread of COVID-19 loving behaviors at the level of the population which will compromise the government measures. To this effect, social media, TV, and Radio communication are not enough to pass on useful information to the population, since some are simply not interested in watching the news. It will therefore be of importance for other measures like forming local communicators among the populations. Also, it will be necessary for the government to make sure that these measures are not only known but implemented.

Regarding the association between knowledge on COVID-19 and use of hand sanitizers, there was a semi-strong insignificant positive relationship using interferential statistics (r=0.406, p=0.097); a significant positive relationship between knowledge on COVID-19and handwashing with soap (r=0.320, p=0.005

and a strong positive significant relationship between knowledge of COVID 19 and the use of face masks (r=0.701, p=0.001). This positive relationship between knowledge and behavior of Cameroonians with regards to the preventive measures of COVID-19 is in line with the study of Zhu and Xie (2014) who found that there was a significant relationship between knowledge and attitude since their results indicated that an individual's attitude changed significantly after reading the information, and the attitude change pattern was affected by the information type and the interaction between the information type and the participant's knowledge level [29].

With regards to the perception of Cameroonians on COVID-19, majority of respondents are favorable to the fact that COVID-19 is a viral infection that can infect everyone (95.72%) in accordance with the study of Akwa and collaborators in Cameroon [12]. More of the respondents incriminated person-to-person contacts, droplets infections through coughing or sneezing, eating contaminated food as the principal means of transmission. A larger majority (91.90%) of participants approved that the most efficient way to limit the spread of the pandemic was by respecting hygienic measures and social distancing. This corroborates with the result of the study of Geldsetzer (2020) in the USA where he affirmed that participants had good knowledge of the mode of transmission [27]. Concerning the question of whether the pandemic will end someday in Cameroon, more than half (58.8%) thinks it is possible if hygienic and government measures are respected, while fewer do not believe COVID-19 will end in Cameroon because they think it is end time (1.6%). This is different from the results obtained by Zhong *et al.,* (2020) where about 97.1% of Chinese believed their government will succeed in the fight against the pandemic [3]. This difference could be explained by the sociopolitical characteristics that differ for both countries.

To the respondents, on the question to know if governmental measures were sufficient enough to stop the spread of the pandemic, the governmental measures taken so far can only be sufficient enough to stop the spread of the COVID-19 in Cameroon if the government adds other measures like total confinement in all affected regions, travel bans from heavily affected zones to non/less affected zones (33.56%) and the provision of face masks, hand sanitizers and foodpieces of stuff, and above all assurance that these measures be respected all over the national territory. A few, 81 (18.47%) think the governmental measures are enough to stop the spread if only the population strictly respects these measures.

Generally, this high level of awareness and somewhat favourable attitude of the participants towards COVID-19 could be explained by the fact that most Cameroonians are active in the quest for information about the deadly COVID-I9 pandemic through various means they dispose of; social media, radio, and television. Also, the country is not left out in the course of modernization of the world in terms of evolving technologies like the widespread of android phones permitting a rapid search of information on actual problems of global importance like the present pandemic. Moreover, the fact that the virus was already spreading and deadly in other parts of the world, Cameroonians adopted a curious attitude towards information regarding COVID-19 because they knew it will somehow spread to Cameroon. Also, the morbidity and mortality of the pandemic especially in Europe and America would have made Cameroonians adopt a good attitude towards COVID-19 so as not to get infected.

Regarding participant's compliance with the governmental and hygienic measures, several aspects were evaluated amongst which, the practice of handwashing. A great proportion of the respondents admitted that they practice handwashing 405/444(91.2%) against a few, 16/444 (3.6%) who did not practice handwashing as a preventive measure against COVID-19. Among those who practice hand washing, about 124/405 (27.9%) washed their hands often with running water and soap while 160/444 (36.0%) use alcoholic-based hand sanitizers as many times as possible. The reasons for not practicing or poorly practicing handwashing (Table XI) were non-accessibility to water (3.2%), lack of finances to get soap often, or alcoholic-based hand sanitizers (4.5%), while a few did not believe hand washing can stop the spread of a respiratory virus. These results simply denote that majority did not practice handwashing not because they actually lacked finances or non-accessibility of water but probably due to the non-compliance with this role, not making it a habit. With respect to the use of face masks, majority of respondents were compliant with the use of face masks when going out of their homes in recent days (90.77%). This is slightly lower than the proportion of respondents who wore masks in the study of Zhong and collaborators

(98%) in China. This difference could be attributed to the difference in sample size since they had up to 6919 participants [3].

4.1 Limits of the Survey

The bias of participation in the study since not every Cameroonian have an android phone, good internet connection or live in regions of stable electricity. Also, the sample size was small. To add, it is difficult for such studies to control the eligibility criteria because Cameroonians who did not fall into the eligibility criteria could have responded to the questionnaire. Finally, the risk of double respondents was also possible with this type of survey.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In as much as most Cameroonians have heard of the COVID-19 pandemic mainly through social media and radio and television. The level of knowledge on the pandemic; transmission, symptoms, hygienic, and governmental preventive measures was appreciable.

Generally, attitudes towards these measures was positive among most participants who was optimistic that the virus will be defeated if preventive and governmental measures are respected. However, this was not the same with compliance. This was relatively low concerning measures concerning handwashing, social distancing, and usage of masks. Though most participants practiced hand washing, a considerable proportion didn't do it properly due to several reasons amongst which lack of water and soap all the time because of too much water cut in our society alongside electricity shortage; lack of money to get a hand sanitizer and believes. A good number of Cameroonians also use alcohol-based hand sanitizer.

This study revealed that there was no significant relationship between the gain of knowledge on COVID-19 and the user of hand sanitizer. However, a very significant relationship was shown between the gain of knowledge and handwashing with soap and running water as well as the use of face masks. This only comes to show that the additional governmental measures put in place to fight against COVID-19 in Cameroon are yielding fruits as most Cameroonians adhere to them though much is still left to be done.

5.2 Recommendations

The Cameroon government should ensure that follow-up and stringent measures are implemented to ensure that preventive and control measures are respected.

The government should create or encourage the creation of local committees or encourage the involvement of the local and non-government organizations in the fight most especially in sending out proper communication and information.

The populations should be provided financial and material aid to increase compliance with preventive measures

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

WHAT IS KNOWN ABOUT THE TOPIC

- Cameroonians are aware of COVID-19, its transmission, and preventive measures
- The perception of Cameroonians about COVID-19; majority think Coronavirus originated from animals while a non-negligible part think it is man-made
- The WHO preventive measures are known and understood by participants of previous studies

WHAT THIS STUDY ADDS

- Awareness of Cameroonians on the governmental preventive measures
- Compliance of Cameroonians in the implementation of government measures and the WHO preventive measures
- Association between knowledge on COVID-19 and practice of preventive measures

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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