SciencePG
Science Publishing Group

Knowledge, Perception and Attitude of Patients at CNHU-HKM of Cotonou About COVID-19

Azon Kouanou Angèle[*], Wanvoégbè Armand Finagnon,
Agbodandé Kouessi Anthelme Mahoutin Sèmassa Ghislain Missiho, Yves Morel Sokadjo,
Faladé Adélakoun Ange Géoffroy, Assogba Houénoudé Mickaël Arnaud,
Murhula Katabana Delphin, Mukwege Bimji Lisa, Oba Richard, Eugénie Dansou,
Djimon Marcel Zannou, Fabien Houngbé

University Clinic of Internal Medicine and Medical Oncology of CNHU-HKM, University of Abomey-Calavi (UAC), Cotonou, Benin

Email address:
angele.azonkouanou@gmail.com (A. K. Angèle)
[*]Corresponding author

Abstract: COVID-19 has been noticed in Benin since March 2020. Various measures have been put in place to curb the epidemic. The objective of the study is to evaluate the knowledge and perception of patients at the CNHU-HKM about COVID-19. This was a cross-sectional study with descriptive and analytical purposes. Data were collected from July 1, 2020 to January 1, 2021. The participants were included in the outpatient clinic of the specialized medical services of the CNHU-HKM. They answered to questions related to their knowledge and perception about COVID-19. Data analysis was done with R 4.1.0 software. A total of 353 respondents were included in the study. The sex ratio was 0.81. The mean age was 48.9±16.8 [10; 92] years. The residence was in urban places for 91.5% of them. The level of education was at least high school in 82.2% of the cases. The agent responsible for COVID-19 and the mode of transmission were not known, respectively, by 31.7% and 89.2% of the participants. Barrier measures were known by 46.2%, while clinical manifestations were known by 89.0%. Only the level of education was associated with knowledge of COVID-19 (p<0.001). Findings revealed that good knowledge of the pandemic was related to the level of education. A readjustment of communication strategies towards less educated groups would be recommended.

Keywords: Knowledge, Patient, COVID-19

1. Introduction

COVID-19 is an emerging viral disease [1] that reported in China in late 2019 [2, 3]. It is caused by a new virus of the coronavirus-like family. Actually, the origin of the virus has not yet been elucidated. The hypothesis of transmission to humans from animal reservoirs is suspected [2]. The virus has spread rapidly throughout the world and is currently responsible for more than 160 million cases of infestation, including 3 million deaths [4, 5]. Transmission is human-to-human and occurs through the inhalation of contaminated respiratory droplets, either airborne or deposited on surfaces

[6]. Cases of contamination of pets have been reported [7, 8]. The disease is manifested by a non-specific symptomatology, associated to various degrees respiratory signs, fever, and sometimes digestive and neurosensory signs [9]. Various curative treatments have been proposed but have proven to be limited [10]. Barrier measures and vaccination are the main successful means to control the pandemic [11].

In Benin, the first case was officially declared on March 16, 2021 [12]. However, in spite of the early sensitization measures enacted by the health authorities, difficulties in getting the population to adhere to these measures have been observed [12]. These difficulties have already been observed

internationally, notably during previous epidemics. Taking into account the aforementioned elements, we noticed that they have motivated studies on checking the knowledge, attitudes, and perception of the population and researchers got a strong relation between the level of knowledge and adherence [13, 14]. When people know more about a health issue, it is easy to control it with their involvement. In Benin, the biggest teaching hospital (CNHU-HKN) is a place where a huge number of patients come daily. In addition, it is a place with higher risk of contamination because a number of infected people have also been detected during admissions. To control better the spread of COVID-19 in that strategical health institution, we decided to initiate this study that is going to be a checking on how people coming to that risky environment are informed on the virus. The objective of this current work was therefore to evaluate the knowledge, perceptions, and practices of the patients in the Centre Nationale Hospitalier Universitaire Hubert K. MAGA at Cotonou (CNHU-HKM) on COVID-19. The results are to be used by authorities to adjust policies about sensitisation against corona virus spread.

2. Sample and Methods

2.1. Sample Description

The place in which this study was led is the CNHU-HKM and the data were collected from July 1, 2020 to January 1, 2021. The study population consisted of outpatients of specialized medical services. Every participant who was free and accepted was included. The sampling was random and exhaustive, based on systematic recruitment of all respondents that met our criteria. Actually, we got a mixed data of 353 observations. We got variables about sociodemography, knowledge/attitude/practice related to the pathology, influence of the pandemic, and perspectives. For deeper understanding, we will make the data set available if requested.

2.2. Methods

The current work is a cross-sectional study with a descriptive and analytical purpose. Data were collected using a self-administered questionnaire under the supervision of an interviewer. The questionnaire consisted of a socio-demographic section and a series of multiple-choice questions grouped into three sections: knowledge, attitude, and perception.

For the assessment of knowledge, any correct answer for an item was given a score of one (1); and any wrong answer or no answer was given a score of zero (0). Knowledge was considered good, intermediate, or poor depending on whether at least 85%, between 85% and 50%, and less than 50% of correct propositions were checked. Firstly, the work was about descriptive statistics and we output mean, minimum, maximum, and standard deviation for numerical variables and frequency and proportion for categorical variables. Secondly, a relationship was then sought between the

different knowledge items and the socio-demographic variables by Khi2 test (when the hypothesis are respected) or Fisher exact test (a non parametric test). The significance level was set at 5%. We used the software R 4.1.0 software to compute the analyses. To easy the understanding ot the analysis process, we proposed an illustration on the figure [1].
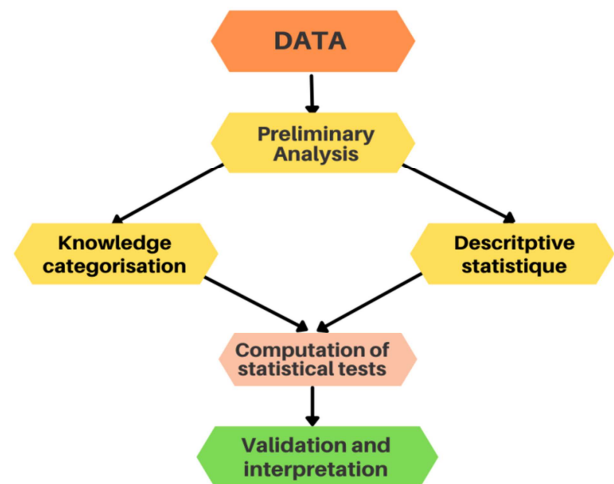

Figure 1. Analysis process illustration, CNHU-HKM, 2021.

2.3. Ethical Considerations

The favorable opinion of the local ethics committee was obtained prior to the start of the study. The free and informed consent of each respondent was required before the questionnaire was submitted. Anonymity and confidentiality were respected.

2.4. Ethical Considerations

A favourable opinion from the local ethics committee was obtained before the start of the study. Free and informed consent was required from each of the agents before submission of the questionnaire. Data were collected anonymously to ensure patient confidentiality

3. Results

3.1. Sociodemographic Data

A total of 353 respondents were included in the study. The mean age was 48.9±16.8 years, with a minimum of 18 years old and a maximum of 92. Men accounted for 44.8% and women for 55.2%, for a sex ratio of 0.81. The majority of respondents lived in urban areas (91.5%). The level of education was at least secondary for 82.2% of the respondents, while 9.9% had never been educated. (Table 1).

3.2. Knowledge

In the table 2, it is easy to notice that the knowledge of the causative agent of COVID-19 was good in 31.7% of respondents. Knowledge of the mode of transmission of the pathogen was intermediate in more than three-quarters of the cases (77.6%). A good knowledge of preventive measures

was found in 55.8% of the respondents. There was a good knowledge of the clinical manifestations of 40.8% of the respondents.

3.3. Perception and Attitude

In the table 3, we can readt that for 92.2% of the participants, COVID-19 is not real. Stress and anxiety were perceived by 40.2% and 39.9% of the respondents, respectively, and 79.5% were afraid of having COVID-19. An attitude of caution was declared by 70.8% of the respondents. Trivialization and indifference were observed in 2.0% and 5.1% respectively. (Table 3)

Table 1. *Sociodemographic characteristics of respondents, CNHU-HKM, 2021 (N=353).*

Variables	n (%)
Age (in year)	
Mean±SD	48.9±16.8 years old
Min - Max	18 – 92 years old
Sex	
Female	195 (55.2)
Male	158 (44.8)
Residence	
Rural	30 (08.5)
Urban	323 (91.5)
Education	
Non	35 (09.9)
Primary	28 (07.9)
Secondary	132 (37.4)
High school	158 (44.8)
Profession	
Lerner	30 (08.5)
Employed in private sector	45 (12.7)
Retired employee from private sector	8 (02.3)
Public servant	79 (22.4)
Retired public servant	70 (19.8)
Housewife	36 (10.2)
Freelancer	85 (24.1)
Marital status	
Sinlge	76 (21.5)
Separated	6 (01.7)
Married	254 (72.0)
Widowed	17 (04.8)

Table 2. *Distribution of respondents according to knowledge of COVID-19, CNHU-HKM, 2021 (N=353).*

	>85 n (%)	85>x≥50 n (%)	<50 n (%)
Responsible Agent	241 (68.3)	-	112 (31.7)
Transmission Mode	49 (13.9)	274 (77.6)	30 (8.5)
Prevention Measures	197 (55.8)	96 (27.2)	60 (17.0)
Clinical manifestations	143 (40.5)	158 (44.8)	52 (14.7)

Table 3. *Distribution of respondents by perception and attitude about COVID-19, CNHU-HKM, 2021 (N=353).*

	n (%)
Perception	
Stress	
Yes	142 (40.2)
No	211 (59.8)
Anxiety	
Yes	116 (32.9)
No	237 (67.1)

	n (%)
Perception of risk related to the disease	
Death	3 (0.8)
Healing	316 (89.5)
Uncertainty	28 (7.9)
Is COVID19 real ?	
Yes	25 (7.1)
No	328 (92.9)
Feelings about COVID19	
Afraid to be infected by COVID19	271 (79.5)
Afraid to die	22 (6.5)
Afraid to contaminate others	10 (2.9)
Afraid to experience the death of a loved one	13 (3.8)
Attitude	
Caution	
Yes	250 (70.8)
No	103 (29.2)
Banalization	
Yes	7 (2.0)
No	348 (98.0)
Indifference	
Yes	18 (5.1)
No	335 (94.9)

Table 4. *Association between sociodemographic characteristics and knowledge of the pathogen, CNHU-HKM, 2021 (N=353).*

	Good n (%)	Intermediate n (%)	Poor n (%)	P
Sex				<0.001
Male	124 (78.5)		34 (21.5)	
Female	117 (60.0)		78 (40.0)	
Residence				0.066
Urban	225 (69.7)		98 (30.3)	
Rural	16 (53.3)		14 (46.7)	
Education				<0.001
Non	7 (20.0)		28 (80.0)	
Primary	12 (42.9)		16 (57.1)	
Secondary	86 (65.2)		46 (34.8)	
High school	136 (86.1)		22 (13.9)	

Table 5. *Association between sociodemographic characteristics and knowledge of the mode of transmission, CNHU-HKM, 2021 (N=353).*

	Good n (%)	Intermediate n (%)	Poor n (%)	P
Sex				0.221
Male	27 (17.1)	120 (75.9)	11 (7.0)	
Female	22 (11.3)	154 (79.0)	19 (9.7)	
Residence				0.073
Urban	48 (14.9)	250 (77.4)	25 (7.7)	
Rural	1 (3.3)	24 (80.0)	5 (16.7)	
Education				<0.001
Non	1 (2.9)	1 (2.9)	9 (25.7)	
Primary	4 (14.3)	22 (78.6)	2 (7.1)	
Secondary	12 (9.1)	111 (84.1)	9 (6.8)	
High school	32 (20.3)	116 (73.4)	10 (6.3)	

Table 6. *Association between sociodemographic characteristics and knowledge of preventive measures, CNHU-HKM, 2021 (N=353).*

	Good n (%)	Intermediate n (%)	Poor n (%)	P
Sex				0.144
Male	97 (61.4)	36 (22.8)	25 (15.8)	
Female	100 (51.3)	60 (30.8)	35 (17.9)	
Residence				0.235
Urban	184 (57.0)	84 (26.0)	55 (17.0)	
Rural	13 (43.3)	12 (40.0)	5 (16.7)	
Education				<0.001
Non	15 (42.9)	18 (51.4)	2 (5.7)	

	Good n (%)	Intermediate n (%)	Poor n (%)	P
Primary	6 (21.4)	16 (57.1)	6 (21.4)	
Secondary	76 (57.6)	35 (26.5)	21 (15.9)	
High school	100 (63.3)	27 (17.1)	31 (19.6)	

Table 7. *Association between sociodemographic characteristics and knowledge of clinical manifestations of COVID-19, CNHU-HKM, 2021 (N=353).*

	Good n (%)	Intermediate n (%)	Poor n (%)	P
Sex				0.772
Male	2 (1.3)	74 (46.8)	82 (51.9)	
Female	3 (1.5)	84 (43.1)	108 (55.4)	
Residence				0.161
Urban	5 (1.5)	149 (46.1)	169 (52.3)	
Rural	0 (0.0)	9 (30.0)	21 (70.0)	
Education				
Non	0 (0.0)	5 (14.3)	30 (85.7)	0.005
Primary	0 (0.0)	11 (39.3)	17 (60.7)	
Secondary	68 (51.5)	61 (46.2)	3 (2.3)	
High school	75 (47.5)	81 (51.3)	2 (1.3)	

3.4. Association Between Socio-demographic Characteristics and Knowledge

We have checked the possible associations. The rate of good knowledge regarding the pathogen (table 4), the mode of contamination (table 5), preventive measures (table 6), and clinical manifestations of COVID-19 (table 7), was significantly higher among respondents with secondary and higher education. For the causative agent, the rate of good knowledge was significantly higher with men compared to women.

4. Discussion

4.1. Knowledge

The rate of good knowledge regarding the pathogen, the mode of contamination, preventive measures, and clinical manifestations of COVID-19 was significantly higher among respondents with secondary and higher education. In black Africa, Yapi et al [15] in Côte d'Ivoire, Ibrahim et al [16] and Habib et al [17] in Nigeria and Mohamed et al [18] in Sudan made the same observation. This observation is common elsewhere in the world according to the literature [19-35]. People with at least a secondary level of education would therefore have prerequisites that make it easier to integrate new information about the pandemic. Yapi et al [15] and Aweke et al [36] in Ethiopia, found that these people would also have easier access to additional and more complete sources of information, especially via the Internet. This is the more true if we take into account the nature of the information concerned. Indeed, more technical information such as pathogen or modes of contamination were relatively less well known than those concerning preventive measures according to the studies [31, 33, 34, 36-39]. It also follows that communication strategies at the local level should be reoriented and adapted to the educational level of the population. In addition, other factors associated with knowledge have been highlighted by other studies. Ladiwala et al [40] in Pakistan and Zhong et al in China **[38]**, for example, identified male gender and advanced age or marital status as factors of poor knowledge. Observations in the opposite direction were found in the literature [17, 26, 31, 34]. A meta-analysis will make it possible to specify the association or not of the level of knowledge with one or the other of these factors. It could be a question of confounding factors related to the constitution of the different samples.

4.2. Perception and Attitude

COVID-19 was responsible for increased stress and anxiety in nearly half of the respondents. About one in eight respondents was afraid of contracting the disease but remained optimistic about the chances of recovery. In the study by Yapi et al [15] in Côte d'Ivoire, half of the respondents felt they were at low risk of contracting the disease. Indeed, the majority of the respondents were young and therefore considered themselves to be at lower risk. In contrast, in the Honavar et al [33] study in Iran and in the Zhong et al [38] study in China, a larger proportion of the respondents were afraid of the disease, notably because of the higher prevalence and mortality in these countries. As in our study, the majority of the respondents considered the chances of recovery higher than that of death. Information on risk factors and morbidity of COVID-19 would therefore influence people's perception of risk related to the disease.

Overall, in our study the respondents had. Approximately 10% declared that they were indifferent to or trivialized the crisis. Actually, for this same proportion, COVID-19 would not be real. A poor knowledge of the disease could explain these attitudes, as observed by Tomar et al [23] in India. For Abubakari [41] in Ghana, Manya Mboni [42] in Congo and Yapi et al [15] in Côte d'Ivoire, socio-demographic characteristics and sources of information determine good attitudes. From this, it can be deduced that a more adapted awareness is necessary to improve the adherence of the population.

4.3. Limitations

This study was limited to a hospital survey of users. Unlike other studies in the sub-region [15, 42, 43] and internationally [17, 19, 28, 44, 45], it was not possible to carry out a large-scale survey, particularly via the Internet, because of the poor Internet coverage in our country and the disparity in access within the population. This makes the sampling. An analysis of the association between knowledge, attitudes, and perceptions is also desirable to complete this study.

5. Conclusion

Good knowledge of the pathogen, the mode of contamination, preventive measures and clinical manifestations of COVID-19 was significantly associated with the respondents' level of secondary and higher education. Indeed, the latter inform

themselves a lot on current events, they often have a prerequisite, and quickly integrate new information. This leads us to revise the communication strategy towards the rest of the population so that knowledge about COVID19 is better, and preventive measures are more appropriate.

Conflicts of Interest

The authors declare that they have no competing interests.

References

[1] Organisation Mondiale de la santé. Naming the coronavirus disease (COVID-19) and the virus taht causes it [Internet]. Organisation Mondiale de la santé. [cité 15 mars 2021]. Disponible sur: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it.

[2] Zhou P, Yang X-L, Wang X-G, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature. 2020; 579 (7798): 270-3.

[3] Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan China. Lancet. 2020; 395 (10223): 496.

[4] Organisation Mondiale de la santé. Chronologie de l'action de l'OMS face à la COVID-19 [Internet]. Organisation Mondiale de la santé. [cité 15 mars 2021]. Disponible sur: https://www.who.int./fr/news/item/29-06-2020-covidtimeline.

[5] Cheng Z, Shan J. Novel coronavirus: where we are and what we know. Infection. 2020; 48: 1-9.

[6] Chen N, Zhou M, Dong X. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. 2020; 395: 507-13.

[7] Animaux de compagnie et COVID-19. Bull Académie Natl Médecine. juill 2020; 204 (7): 640-1.

[8] Leroy E, Le Gouil M, Brugère-Picoux J. Transmission du covid-19 aux animaux de compagnie : un risque à ne pas négliger. Bull Académie Vét Fr [Internet]. 2020 [cité 5 juill 2021]; (2). Disponible sur: http://hdl.handle.net/2042/70839.

[9] A rapid guideline for the diagnosis and treatment of 2019 novel coronavirus [2019-nCov] infected pneumonia. Mil Med Res. 2020; 7 (4): 4-9.

[10] Matusik É, Ayadi M, Picard N. Covid-19, prise en charge, pistes thérapeutiques et vaccinales. Actual Pharm. oct 2020; 59 (599): 27-33.

[11] Ou F, Wu H, Yang Y, Tan W, Zhang J, Gu J. Countermeasures for rapid spread of new coronavirus pneumonia in Wuhan, China General. Pract Nurs. 2020; 19-23.

[12] Gouvernement de la République ddu Bénin. Informations coronavirus (COVID-19) [Internet]. Gouvernement de la République du Bénin. [cité 15 mars 2021]. Disponible sur: https://www.gouv.bj/coronavirus.

[13] Hung L. The SARS epidemic in Hong Kong: What lessons have we learned? Journal of the Royal Society of Medicine. 2003; 96 (8): 374–378.

[14] Yousaf M, Yousaf M, Saleem T, Yousaf I. A Cross-Sectional Survey of knowledge, Attitude, and Practices (KAP) Toward Pandemic COVID-19 Among the General Population of Jammu and Kashmir, India. 2020; 35 (7): 569–78.

[15] Yapi RB, Houngbedji CA, N'Guessan DKG, Dindé AO, Sanhoun AR, Amin A, et al. Knowledge, Attitudes, and Practices (KAP) Regarding the COVID-19 Outbreak in Côte d'Ivoire: Understanding the Non-Compliance of Populations with Non-Pharmaceutical Interventions. Int J Environ Res Public Health. 29 avr 2021; 18 (9): 4757.

[16] Ibrahim et al. - 2021 - Knowledge Attitude and Preventive Practices toward.pdf.

[17] Habib MA, Dayyab FM, Iliyasu G, Habib AG. Knowledge, attitude and practice survey of COVID-19 pandemic in Northern Nigeria. Mallhi TH, éditeur. PLOS ONE. 14 janv 2021; 16 (1): e0245176.

[18] Mohamed AAO, Elhassan EAM, Mohamed AO, Mohammed AA, edris HA, Mahgoop MA, et al. Knowledge, attitude and practice of the Sudanese people towards COVID-19: an online survey. BMC Public Health. déc 2021; 21 (1): 274.

[19] Amin F, Sharif S, Saeed R, Durrani N, Jilani D. COVID-19 pandemic- knowledge, perception, anxiety and depression among frontline doctors of Pakistan. BMC Psychiatry. déc 2020; 20 (1): 459.

[20] Lee H, Moon SJ, Ndombi GO, Kim K-N, Berhe H, Nam EW. COVID-19 Perception, Knowledge, and Preventive Practice: Comparison between South Korea, Ethiopia, and Democratic Republic of Congo. South Korea.: 12.

[21] Widhani A, Rengganis I, Susanto AJ, Surachmanto EE, Hasibuan AS, Fetarayani D, et al. Factors Related to Knowledge, Perception, and Practices Towards COVID-19 Among Patients with Autoimmune Diseases: A Multicenter Online Survey. Acta Med Indones. 2020; 52 (3): 13.

[22] Amalakanti S, Raman Arepalli KV, Koppolu RK. Gender and Occupation Predict Coronavirus Disease 2019 Knowledge, Attitude and Practices of a Cohort of a South Indian State Population. Indian J Med Microbiol. avr 2020; 3 8 (2): 144-56.

[23] Tomar BS, Singh P, Suman S, Raj P, Nathiya D, Tripathi S, et al. Indian community's Knowledge, Attitude & Practice towards COVID-19 [Internet]. Public and Global Health; 2020 mai [cité 14 juill 2021]. Disponible sur: http://medrxiv.org/lookup/doi/10.1101/2020.05.05.20092122.

[24] O'Conor R, Opsasnick L, Benavente JY, Russell AM, Wismer G, Eifler M, et al. Knowledge and Behaviors of Adults with Underlying Health Conditions During the Onset of the COVID-19 U.S. Outbreak: The Chicago COVID-19 Comorbidities Survey. J Community Health. déc 2020; 45 (6): 1149-57.

[25] Olaimat AN, Aolymat I, Shahbaz HM, Holley RA. Knowledge and Information Sources About COVID-19 Among University Students in Jordan: A Cross-Sectional Study. Front Public Health. 29 mai 2020; 8: 254.

[26] Kasemy ZA, Bahbah WA, Zewain SK, Haggag MG, Alkalash SH, Zahran E, et al. Knowledge, Attitude and Practice toward COVID-19 among Egyptians: J Epidemiol Glob Health. 2020; 10 (4): 378.

[27] Dkhar S, Quansar R, Saleem S, Khan SmS. Knowledge, attitude, and practices related to COVID-19 pandemic among social media users in J&K, India. Indian J Public Health. 2020; 64 (6): 205.

[28] Fatmi Z, Mahmood S, Hameed W, Qazi I, Siddiqui M, Dhanwani A, et al. Knowledge, attitudes and practices towards COVID-19 among Pakistani residents: information access and low literacy vulnerabilities. East Mediterr Health J. 1 déc 2020; 26 (12): 1446-55.

[29] Moradzadeh R, Nazari J, Shamsi M, Amini S. Knowledge, Attitudes, and Practices Toward Coronavirus Disease 2019 in the Central Area of Iran: A Population-Based Study. Front Public Health. 8 déc 2020; 8: 599007.

[30] Van Nhu H, Tuyet-Hanh TT, Van NTA, Linh TNQ, Tien TQ. Knowledge, Attitudes, and Practices of the Vietnamese as Key Factors in Controlling COVID-19. J Community Health. déc 2020; 45 (6): 1263-9.

[31] Bates BR, Moncayo AL, Costales JA, Herrera-Cespedes CA, Grijalva MJ. Knowledge, Attitudes, and Practices Towards COVID-19 Among Ecuadorians During the Outbreak: An Online Cross-Sectional Survey. J Community Health. déc 2020; 45 (6): 1158-67.

[32] Lin Y, Hu Z, Alias H, Wong LP. Knowledge, Attitudes, Impact, and Anxiety Regarding COVID-19 Infection Among the Public in China. Front Public Health. 27 mai 2020; 8: 236.

[33] Honarvar B, Lankarani KB, Kharmandar A, Shaygani F, Zahedroozgar M, Rahmanian Haghighi MR, et al. Knowledge, attitudes, risk perceptions, and practices of adults toward COVID-19: a population and field-based study from Iran. Int J Public Health. juill 2020; 65 (6): 731-9.

[34] Abdelhafiz AS, Mohammed Z, Ibrahim ME, Ziady HH, Alorabi M, Ayyad M, et al. Knowledge, Perceptions, and Attitude of Egyptians Towards the Novel Coronavirus Disease (COVID-19). J Community Health. oct 2020; 45 (5): 881-90.

[35] Anwar S, Araf Y, Newaz Khan A, Ullah MdA, Hoque N, Sarkar B, et al. Women's Knowledge, Attitude, and Perceptions Toward COVID-19 in Lower-Middle-Income Countries: A Representative Cross-Sectional Study in Bangladesh. Front Public Health. 17 nov 2020; 8: 571689.

[36] Aweke Z, Jemal B, Mola S, Hussen R. Knowledge of COVID-19 and its prevention among residents of the Gedeo zone, South Ethiopia. Sources of information as a factor. Curr Med Res Opin. 1 déc 2020; 36 (12): 1955-60.

[37] Min C, Shen F, Yu W, Chu Y. The relationship between government trust and preventive behaviors during the COVID-19 pandemic in China: Exploring the roles of knowledge and negative emotion. Prev Med. déc 2020; 141: 106288.

[38] Zhong B-L, Luo W, Li H-M, Zhang Q-Q, Liu X-G, Li W-T, et al. 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 (10): 1745-52.

[39] Itodo GE, Enitan SS, Oyekale AO, Agunsoye CJ, Asukwo UF, Enitan CB. COVID-19 among Healthcare Workers: Risk of Exposure, Impacts and Biosafety Measures – A Review.: 15.

[40] Ladiwala ZFR, Dhillon RA, Zahid I, Irfan O, Khan MS, Awan S, et al. Knowledge, attitude and perception of Pakistanis towards COVID-19; a large cross-sectional survey. BMC Public Health. déc 2021; 21 (1): 21.

[41] Abubakari I. KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) ON THE COVID-19 PANDEMIC.: 10.

[42] Manya Mboni Henry, Mutombo Shakalenga Cedrick, Bashige Chiribagula Valentin, Nzuzi Mavungu Gaël, Kabamba Tshikongo Arsène, Mutombo Mulangu Augustin, et al. Knowledge, attitudes and practices among the population, towards COVID-19 in the Lubumbashi city (DR Congo): An online cross-sectional survey. World J Biol Pharm Health Sci. 30 mars 2021; 5 (3): 01-018.

[43] Ibrahim R, Kabir ZO, Yahaya IA, Itopa OB, Yakubu A, Abdullahi AO. Knowledge Attitude and Preventive Practices towards Infection by Severe Respiratory Syndrome-CoV-2 among Residents of Kogi State during the COVID-19 Pandemic. J Adv Med Med Res. 15 févr 2021; 36-46.

[44] Zhang M, Zhou M, Tang F, Wang Y, Nie H, Zhang L, et al. Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan, China. J Hosp Infect. juin 2020; 105 (2): 183-7.

[45] Srichan P, Apidechkul T, Tamornpark R, Yeemard F, Khunthason S, Kitchanapaiboon S, et al. Knowledge, Attitude and Preparedness to Respond to the 2019 Novel Coronavirus (COVID-19) Among the Bordered Population of Northern Thailand in the Early Period of the Outbreak: A Cross-Sectional Study. SSRN Electron J [Internet]. 2020 [cité 14 juill 2021]; Disponible sur: https://www.ssrn.com/abstract=3546046.