Knowledge, attitudes and practices towards COVID-19 in Paraguayans during outbreaks: a quick online survey.

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Abstract:

Background: Until March 22, 2020, 22 cases are registered in Paraguay, of which there are two cases with epidemiological links to be determined. The country's authorities have applied necessary sanitary measures to prevent massive spread. It is imperative to know the knowledge, attitudes and practices of the population about COVID-19, for decision making.

Methods: A cross-sectional study was carried out from March 20, 2020, the week immediately after the closure of Paraguay. The survey was online using a Google Forms (c) form distributed through "WhatsApp" groups. Paraguayan nationals, over 18 years of age, who were explained the objectives and purpose of the study, who agreed to participate in the study, were asked to complete the questionnaire by clicking on the link.

Results: A total of 3141 participants completed the survey questionnaire. The mean age was 29.55 years (SD: 10.7), 2139 (68.10%) were women, and 2073 (66) were Interior. The mean COVID-19 knowledge score was 7.45 (SD: 1.51), suggesting an overall 62% (7.45/12*100) correct rate on this knowledge test. The majority of the respondents agreed that COVID-19 will finally be successfully controlled (66.28%), the vast majority of the participants had not visited any crowded place (88.35%) and wore masks when going out (74.31%) in recent days

Conclusion: The knowledge about COVID-19 in the Paraguayan population during the outbreak was acceptable, attitudes have been mostly favorable and the practices are mostly adequate, however, it is necessary to implement massive education campaigns, to increase the proportion of knowledge about COVID-19, to stop its spread.

Keywords: Coronavirus Infections; COVID-19; Health Knowledge, Attitudes, Practice; Paraguay.

Introduction

Since December 2019, a number of unexplained cases of pneumonia have been reported in Wuhan, China, prompting the Chinese government and researchers to take swift steps to control the epidemic and carry out etiological investigations(1). On January 12, 2020, the World Health Organization (WHO) tentatively named this new virus as the new coronavirus 2019 (2019 - nCoV)(2). On January 30, 2020, the WHO announced the 2019-nCoV epidemic, a public health emergency of international concern. On February 11, 2020, the WHO formally named the disease triggered by 2019 - nCoV as coronavirus disease 2019 (COVID-19). On the same day, the coronavirus study group of the International Committee on Virus Taxonomy named 2019 - nCoV as coronavirus 2 of severe acute respiratory syndrome (SARS-CoV-2). On February 23, 2020, there were 77,041 confirmed cases of SARS-CoV-2 infection in China(3).

In the Region of the Americas, a total of 663 cases of COVID-19 have been reported from 12 countries and four (4) French overseas territories/regions. In addition, the United States reported that 49 individuals tested positive for COVID-19 among returnees from Wuhan, China (1) and the Diamond Princess cruise ship (4)(5).

To date, 23 deaths from COVID-19 have been reported in the United States of America(6) and Argentina (1). Death in Argentina was reported as an imported case: a 64-year-old Buenos Aires city resident with multiple underlying conditions and a recent trip to Europe. The 22 deaths in the United States come from the states of California, Florida and Washington; the majority of deaths in Washington State were associated with a long-term care facility(7).

Until March 22, 2020, 22 cases are registered in Paraguay, of which there are two cases with epidemiological links to be determined. The country's authorities have applied necessary sanitary measures to prevent massive spread(8).

To guarantee the final success, people's adherence to these control measures are essential, which is largely affected by their knowledge, attitudes, and practices (KAP) towards COVID-19 in accordance with KAP theory(9–11). Based on all the above, it was proposed to carry out this study to know the knowledge, attitudes and practices of Paraguayans in the period of the COVID-19 outbreak.

Methods

A cross-sectional study was carried out from March 20, 2020, the week immediately after the closure of Paraguay. The survey was online using a Google Forms (c) form distributed through "WhatsApp" groups.

Paraguayan nationals, over 18 years of age, who were explained the objectives and purpose of the study, who agreed to participate in the study, were asked to complete the questionnaire by clicking on the link.

Participants had to answer a yes or no question to confirm their willingness to participate voluntarily. After confirmation of the question, the participant was instructed to complete the self-completed questionnaire.

The Bao-Liang et al(12). Instrument was used as a model (Translated into Spanish). This questionnaire consisted of two parts: demography and KAP. Demographic variables included age, sex, marital status, education, occupation, and current place of residence. The questionnaire had 12 questions: 4 regarding clinical presentations, 3 regarding transmission routes, and 5 regarding prevention and control of COVID-19. These questions were answered true / false with an additional "I don't know" option. A correct answer was assigned 1 point and an incorrect / unknown answer was assigned 0 points. The total knowledge score ranged from 0 to 12, with a higher score denoting better knowledge of COVID-19.

Attitudes toward COVID-19 were measured by 2 questions about COVID-19's final control agreement and confidence in winning the battle against COVID-19. The evaluation of the respondents' practices consisted of 2 behaviors: going to a crowded place and wearing a mask when going out in the last days.

A pilot study was carried out with 10 subjects, with which a Cronbach's Alpha of 0.8 was obtained(13).

The frequencies of correct knowledge responses and various attitudes and practices were described. Knowledge scores and attitudes and practices of different people according to demographic characteristics were compared with independent samples t test, one-way analysis of variance (ANOVA), or Chi-square test as appropriate. Multivariate linear regression analysis using all demographic variables as independent variables and the knowledge score as the outcome variable was performed to identify factors associated with knowledge. Similarly, binary logistic regression analysis was used to identify factors associated with attitudes and practices.

Data analyzes were performed with STATA version 15.0. The level of statistical significance was established at $p < 0.05$.

Results

A total of 3141 participants completed the survey questionnaire. The mean age was 29.55 years (SD: 10.7), 2139 (68.10%) were women, and 2073 (66) were Interior. Other demographic characteristics are shown in Table 1.

The mean COVID-19 knowledge score was 7.45 (SD: 1.51), suggesting an overall 62% (7.45/12*100) correct rate on this knowledge test. Knowledge scores significantly differed across genders, age-groups, categories of marital status, education levels, and residence places ($P<0.001$) (Table 1).

Table 1- Demographic characteristics of participants and knowledge score of COVID-19 by demographic variables

Characteristic		**Number of participants (%)**	**Knowledge score (mean ± standard deviation**	**t/f**	**P**
Gender	Male	1002 (31.90)	7.30 ± 1.72		
	Female	2139 (68.10)	7.53 ± 1.40	3.82	<0.001
Age-group (years)	18 – 29	1901 (60.52)	7.51 ± 1.32		
	30 – 49	1054 (33.56)	7.37 ± 1.77		
	≥ 50	186 (5.92)	7.38 ± 1.72	3.37	<0.001
Marital status	Never-married	2118 (67.43)	7.53 ± 1.32		
	Married	714 (22.73)	7.40 ± 1.75		
	Other*	309 (9.84)	7.07 ± 1.98	12.77	<0.001
Education	None	21 (0.67)	4.00 ± 4.89		
	Primary	45 (1.43)	4.53 ± 3.19		
	Secondary	387 (12.32)	7.31 ± 1.92		
	University	2688 (85.58)	7.55 ± 1.24	107.13	<0.001
Occupation	Students	1268 (40.37)	7.49 ± 1.39		
	Civil servant	1501 (47.79)	7.52 ± 1.55		
	Independents	201 (6.40)	7.31 ± 1.26		
	Unemployed	171 (5.44)	6.78 ± 2.10	13.07	<0.001

Place of current residence	Asuncion (Capital)	474 (15.09)	7.08 ± 2.28		
	Metropolitan area	594 (18.91)	7.46 ± 1.28		
	Interior	2073 (66)	7.54 ± 1.33	18.10	<0.001
*"Others" included re-married, co-habiting, separated, divorced, and widowed.					

Multiple linear regression analysis showed that male gender (vs. female, β: -0.283, P: 0.000), marital status of married (vs. other, β: -0.370, P: 0.000), Education of secondary (vs. University, β: 3.346, P: 0.000), and Place of current residence in Asuncion (vs. Interior, β: 0.347, P:0.000) (Table 2).

Table 2. Results of multiple linear regression on factors associated with poor COVID-19 knowledge

Characteristic	**Coefficient**	**Standard error**	**t**	**P**
Gender (male vs. female	-0.283	0.055	5.07	0.000
Age-group (18 - 29 vs. 30 -49)	-0.101	0.754	-1.34	0.180
Age-group (30 - 49 vs. ≥ 50)	0.632	0.128	0.49	0.623
Marital status (never-married vs. married)	-0.586	0.076	-0.77	0.443

Marital status (married vs. Other)	-0.370	0.925	-4.00	0.000
Education (Primary vs. secondary)	0.711	0.379	1.88	0.061
Education (secondary vs. University)	3.346	0.321	10.42	0.000
Education (Primary vs. University)	3.489	0.313	11.13	0.000
Occupation (Students vs. Civil servant)	0.130	0.702	1.86	0.063
Occupation (Students vs. Independents)	-0.089	0.116	-0.77	0.444
Place of current residence (Asuncion vs. Metropolitan area)	0.243	0.886	2.74	0.006
Place of current residence	0.347	0.743	4.68	0.000

(Asuncion vs. Interior)				

The majority of the respondents agreed that COVID-19 will finally be successfully controlled (66.28%). Rates of reporting “disagree” and “I don't know” were 6.78% and 26.93%, respectively. Statistically significant differences were found between attitudes and gender, age-group, marital status, education, occupation, place of current residence and COVID-19 knowledge score (Table 3).

Table 3. Attitudes towards COVID-19 by demographic variables

Characteristic		**Attitudes, n (%) or mean (standard deviation)**				
		Final success in controlling			**Confidence of winning**	
		Agree	**Disagree**	**Don´t know**	**Yes**	**No**
Gender	Male	687 (68.56)	102 (10.18)	213 (21.26)	843 (84.13)	159 (15.87)
	Female	1395 (65.22)	111 (5.19)	633 (29.59)*	1887 (88.22)	252 (11.78)*
Age-group (years)	18 – 29	1248 (65.65)	140 (7.36)	513 (26.99)	1625 (85.48)	276 (14.52)

	30 – 49	678 (64.33)	70 (6.64)	306 (29.03)	922 (87.48)	132 (12.52)
	≥ 50	156 (83.87)	3 (1.61)	27 (14.52)*	183 (98.39)	3 (1.61)*
Marital status	Never-married	1374 (64.87)	147 (6.94)	597 (28.19)	1821 (85.98)	297 (14.02)
	Married	495 (69.33)	36 (5.04	183 (25.63)	642 (89.92)	72 (10.08)
	Other	213 (68.93)	30 (9.71)	66 (21.36)**	267 (86.41)	42 (13.59)*
Education	None	6 (28.57)	0 (0)	15 (71.43)	18 (85.71)	3 (14.29)
	Primary	24 (53.33)	3 (6.67)	18 (40)	33 (73.33)	12 (26.67)
	Secondary	291 (75.19)	15 (3.88)	81 (20.93)	342 (88.37)	45 (11.63)
	University	1761 (65.51)	195 (7.25)	732 (27.23)*	2337 (86.94)	351(13.06)*
Occupation	Students	824 (64.98)	94 (7.41)	350 (27.60)	1091 (86.04)	177 (13.96)
	Civil servant	991 (66.02)	98 (6.53)	412 (27.45)	1300 (86.61)	201 (13.39)
	Independents	141 (70.15)	15 (7.46)	45 (22.39)	186 (92.54)	15 (7.46)

	Unemployed	126 (73.68)	6 (3.51)	39 (22.81)*	153 (89.47)	18 (10.53)*
Place of current residence	Asuncion (Capital)	261 (55.06)	48 (10.13)	165 (34.81)	375 (79.11)	99 (20.89)
	Metropolitan area	357 (60.10)	54 (9.09)	183 (30.81)	507 (85.35)	87 (14.65)
	Interior	1464 (70.62)	111 (5.35)	498 (24.02)*	1848 (89.15)	225 (10.85)*
COVID-19 knowledge score		7.62 (1.15)	7.40 (1.38)	7.06 (2.12)**	7.51 (1.37)	7.10 (2.18)*
*P:0.000 **P:0.001						

Multiple logistic regression analysis found that male gender (vs. female OR: 1.50 P: 0.000), and COVID-19 knowledge score (OR: 0.78, P: 0.000). Female gender (vs. male OR: 1.3, P: 0.000), age-groups of 18-29 (vs. 30 -49, OR: 1.55, P: 0.000) and COVID-19 knowledge score (OR: 1.18, P: 0.000) (Table 4)

Table 4. Results of multiple binary logistic regression analysis on factors significantly associated with attitudes towards COVID-19

Characteristic	**OR (95% CI)**	**P**
disagree with final success (vs. agree)		
Gender (male vs. female)	1.50 (0.40 - 0.63)	0.000
Age-group (18 -29 vs. 30 -49)	0.78 (0.62 - 0.98)	0.000

COVID-19 knowledge score	0.78 (0.74 - 0.83)	0.000
no confidence of winning		
Gender (male vs. female)	1.31 (1.05 – 1.63)	0.000
Age-group (18 -29 vs. 30 - 49)	1.55 (1.25 -1.92)	0.000
COVID-19 knowledge score	1.18 (1.10 -1.26)	0.000

The vast majority of the participants had not visited any crowded place (88.35%) and wore masks when going out (74.31%) in recent days. Statistically significant differences were found between practices and gender, age-group, marital status, education, occupation, place of current residence and COVID-19 knowledge score (Table 3).

Table 5. Practices towards COVID-19 by demographic variables

		Practices, n (%) or mean (standard deviation)			
Characteristics		**Going to crowded place**		**Wearing a mask**	
		Yes	**No**	**Yes**	**No**
Gender	Male	168 (16.77)	834 (83.23)	255 (25.45)	747 (74.55)
	Female	198 (9.26)	1941 (90.74)*	552 (25.81)	1587 (74.19) *
Age-group (years)	18 – 29	240 (12.62)	1661 (87.38)	498 (26.20)	1403 (73.80)
	30 – 49	108 (10.25)	946 (89.75)	294 (27.89)	760 (72.11)

	≥ 50	18 (9.68)	168 (90.32) *	15 (8.06)	171 (91.94) *
Marital status	Never-married	234 (11.05)	1884 (88.95)	549 (25.92)	1569 (74.08)
	Married	81 (11.34)	633 (88.66)	186 (26.05)	528 (73.95)
	Other	51 (16.50)	258 (83.50) **	72 (23.30)	237 (76.70) **
Education	None	9 (42.86)	12 (57.14)	9 (42.86)	12 (57.14)
	Primary	18 (40)	27 (60)	15 (33.33)	30 (66.67)
	Secondary	39 (10.08)	348 (89.92)	90 (23.26)	297 (76.74)
	University	300 (11.16)	2388 (88.84) *	693 (25.78)	1995 (74.22) **
Occupation	Students	141 (11.12)	1127 (88.88)	319 (25.16)	949 (74.84)
	Civil servant	183 (12.19)	1318 (87.81)	383 (25.52)	1118 (74.48)
	Independents	18 (8.96)	183 (91.04)	57 (28.36)	144 (71.64)

	Unemployed	24 (14.04)	147 (85.96) *	48 (28.07)	123 (71.93) *
Place of current residence	Asuncion (Capital)	93 (19.62)	381 (80.38)	117 (24.68)	357 (75.32)
	Metropolitan area	75 (12.63)	519 (87.37)	123 (20.71)	471 (79.29)
	Interior	198 (9.55)	1875 (90.45)	567 (27.35) *	15069 (72.65) *
COVID-19 knowledge score		6.83 (2.68)	7.54 (1.26)	7.64 (1.71) **	7.39 (1.43) *
*P:0.000 **P:0.001					

Multiple logistic regression analysis found that male gender (vs. female OR: 0.53, P: 0.000), age-group 18-20 (vs. 30 -49, OR: 0.68, P: 0.000), and COVID-19 knowledge (OR:0.81, P:0.000) were significantly associated with going to any crowded place. Male gender (vs. female, OR: 1.01, P: 0.000), and COVID-19 knowledge (OR: 1.13, P:0.000), were significantly associated with not wearing a mask outside (Table 6).

Table 6. Results of multiple binary logistic regression analysis on factors significantly associated with practices towards COVID-19

Characteristic	**OR (95% CI)**	**P**
Going to a crowded place		
Gender (male vs. female)	0.53 (0.42 – 0.67)	0.000

Age-group (18-29 vs. 30 - 49)	0.68 (0.55 -0.85)	0.001
Marital status (never-married vs. married)	1.34) (1.12 – 1.60)	0.001
COVID-19 knowledge score	0.81 (0.76 -0.87)	0.000
Not wearing a mask		
Gender (male vs. female)	1.01 (0.85 -1.21)	0.000
Age-group (18-29 vs. 30 - 49)	0.80 (0.68 – 0.93)	0.000
COVID-19 knowledge score	1.13 (1.06 – 1.20)	0.000

Discussion.

An investigation of Knowledge, Attitudes and Practices can use qualitative as well as quantitative techniques. The idea is to achieve a thorough knowledge of the target audience, so the best thing would be to start with a focus group, to explore the topic and then based on that information put together a survey, select a sample and conduct research(14), due to the current circumstances of the this is difficult in the country and due to the urgency of the case, this first quick survey was carried out through an online survey, constituting the first survey on KAP in COVID-19 in Paraguay.

This study was based on the study by Bao-Liang Zhong et al(12), where they have studied the Knowledge, attitudes and practices towards COVID-19 among Chinese residents during the period of rapidly increasing outbreak of COVID-19, the Spanish translation of the instrument, validated through a pilot study of 10 subjects, after which the mass dissemination to the WhatsApp groups was carried out. No other study similar to this one was found.

The study participants were mostly young adults, university students and residents of the interior of the country (Concepción, San Pedro, Cordillera, Guaira, Caaguazú, Itapúa,

Alto Paraná, Presidente Hayes, and Boquerón), only a small proportion of Asunción and Metropolitan Area, where the first cases of COVID-19 in the country have been reported. The global knowledge was 62%, although it is acceptable, it is still considered low, since basic aspects regarding the COVID-19 and protection measures were explored, this is striking since most of them are university students, in which expect knowledge to be greater. The mean knowledge score on COVID-19 in all groups was similar, however, it was observed that in all cases there was a statistically significant difference between the knowledge score on COVID-19 and gender, the age group, the marital status, education, occupation and place of residence. The results found in this study are lower than those found by Bao-Liang Zhong et al(12), being a higher average than what was found in this study, however, the statistical associations are similar.

The vast majority of attitudes were favorable when it came to successfully controlling COVID-19 and winning the battle, however, it is striking that a proportion of subjects do not know if the virus was successfully controlled, and Another interesting proportion that considers that Paraguay did not win the battle to COVID-19, which can be attributed to false information distributed by social networks, due to the fear and anxiety that exists in these cases, which can be mitigated by a culture of proper use of information. Males have a greater chance of having a good attitude, and those with higher scores on knowledge about COVID-19.

Regarding the practices, most of the practices are adequate. Most of them reported not having gone to places of mass attendance. The risk found between “going to a crowded place” and demographic variables was low, while the risk found between going “without wearing a mask” was 1.01 times more in men than in women, the results are similar to that found by Bao-Liang Zhong et al(12).

The strength of this study lies in its large sample recruited during a critical period, the initial stage of the COVID-19 outbreak, although this sample was composed mainly of people with good academic training who the ones who most easily used social networks were. for completing online surveys, in turn women, who generally have a better predisposition to participate in studies and people from the interior of the country, so, with this study, it is possible to give an approximation of the state of knowledge in this country population; In order to have better approximations, it is necessary to conduct another study adjusting the methodology, trying to obtain results from a population with a lower level of academic training and older age, who are the ones at greatest risk(15,16). The limitations of the study focus mainly on the sample, which was not selected through sampling, in turn the collection method, where the respondents had to have access to the Internet and Smartphone or computers to complete the survey.

As a conclusion, it is possible to indicate that the knowledge about COVID-19 in the Paraguayan population during the outbreak was acceptable, attitudes have been mostly favorable and the practices are mostly adequate, however, it is necessary to implement massive education campaigns, to increase the proportion of knowledge about COVID-19, to stop its spread. With the help of the population and the health authorities, it is possible to stop and decrease COVID-19 cases throughout the Paraguayan territory.

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