# Knowledge and Attitudes of Health Workers for the Care of Patients COVID-19 in some cities of the Colombian Caribbean

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## Abstract

The objective of this work was to evaluate the knowledge and attitudes of health workers in the Colombian Caribbean for the care of COVID-19. The study is inferential, cross-sectional, quantitative; who used an instrument previously validated and used by Shi et al. The population was made up of healthcare workers who work in the health sector of the cities of Cartagena de indias and Barranquilla. A high percentage indicates that they do have the knowledge to care for infected patients (80.21%). The main reasons for not having care provision is not having adequate protection elements (66.09%) and fear of contagion or infecting their family (33.91%). In conclusion, greater attention should be paid to the knowledge and activities of healthcare personnel in the Colombian Caribbean health sector for the care of patients infected with COVID-19.

***Keywords:*** *COVID-19, Hospital sector, Occupational health. World pandemic.*

## Introduction

The World Health Organization (WHO) declared the outbreak of COVID-19 as a pandemic in March 2020[1], but in Colombia the State declared itself in the preparatory phase since the WHO exposed the first case of coronavirus, noting that the entities Ministerial officials were preparing to face their impact in the country[2]. Thus, since January 22, 2020, the community was informed that the Ministry of Health (MinSalud) was updating the detection and treatment protocols for infected patients. However, despite the contingency and mitigation measures that the country has adopted, to date Colombia reports 3105 confirmed cases, 131 deaths and 452 recovered patients[3]. Although the policies and interventions seek to curb the epidemic outbreak by reducing the demand on hospitals to avoid the collapse of the health system and to stop the growth of the epidemic by preventing healthy personnel from contagion, the epidemiological curve continues to increase, testing the system since it exposes the weaknesses that are

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possessed, such as the insufficiency of hospital beds and ICUs, deficiencies in infrastructure and lack of resources for patient care and personal protection elements (PPE) for health workers, who play a fundamental role in these cases and are study subjects of the present investigation[4,5,6,7]. The attitude presented by medical personnel is important to face the epidemic, in the same way, they feel safe having government support and resources for patient care[8,9,10].

Various studies have investigated the knowledge and attitudes of health workers in epidemic situations, working conditions and their willingness to care for infected patients, obtaining as a result psychosocial repercussions related to the concern about contagion, which generates an increased burden. stress, discomfort from the use of PPE and disagreements to comply with quarantine measures when they had low knowledge about SARS, when they feel less fear and when health centers did not work well[11,12] and indicating that it is necessary to encourage adherence to the use of preventive measures, psychological support, and continuing education to prevent uncomfortable attitudes in care [13,14].

There are patients in hospitals in the Colombian Caribbean who have been infected with COVID-19, however, the knowledge and attitudes of health personnel towards infectious diseases and their willingness to work during the COVID-19 outbreak has not yet been investigated, For all of the above, the objective of this study was to assess the knowledge and attitudes of health workers in the Colombian Caribbean for the care of COVID-19, using the instrument developed by Shi et al. [15] and following the structure of the study by Daugherty et al. [16].

## Materials and Methods

An inferential, analytical, cross-sectional, quantitative study was carried out. The population was made up of healthcare workers who work in the health sector of the cities of Cartagena de Indias and Barranquilla. Given the conditions of confinement due to the current pandemic and because there is no database with professionals associated with this sector in the cities considered, a non-probability sampling was carried out for convenience[17]. To determine the sample size, the formula for proportions with infinite population is used, according to García et al. [18] the minimum required sample value is given by:

$$n \geq \frac{Z^2_{1-\alpha/2}\hat{p}(1-\hat{p})}{\varepsilon}$$

n is the sample size
$Z^2_{1-\alpha/2}$ is the value of the normal distribution when you have a confidence level of $(1-\alpha)\times 100\%$
$\hat{p}$ is the estimated proportion of the population parameter.
$\varepsilon$ is the maximum permissible error when moving away from the true value of the proportion.

This study had a 95% confidence level, a maximum error of estimation of less than 5% (4.16%) and given the absence of a pilot study that allows an approximation of it, it is assumed p p = 0.5, since said value maximizes the value of n. Under the above considerations, a minimum sample size of 283 workers dedicated to the trade was obtained, among which are the professions of: Doctors, Nurses, Surgical Instructors, Nursing Assistants, Bacteriologists, Physiotherapists, Pharmacists and Technicians or Technologists in Care Prehospital.

**Instrument:** For the evaluation of knowledge and attitudes of health personnel regarding COVID-19, the questionnaire developed by Shi et al. [15], which was based on the guidelines of the study by Daugherty et al. [16]. The data was collected through the Google Forms online survey tool, which allows the design of questionnaires, data collection and personalized reports. Within the instrument, the respondents were asked for information related to their sociodemographic conditions, such as: age, gender, marital status, profession and

complementary training studies; as well as information associated with the level of knowledge, experience and preparation in COVID-19, among these are: Previous training, sources of information to acquire knowledge, experience in caring for and caring for patients, adequate knowledge and protection measures, understanding of the risks of any epidemic for both patients and workers, knowledge in the care of patients and other staff during an epidemic and provision of patient care.

**Process:** Once the questions of the instrument were included in Google Forms, we proceeded to send the link through the WhatsApp application to different health care workers, who could be located by this means; likewise, informed consent was sent, with the explanation of the study conditions. Requests for completing the survey were made until the 283 responses required in the study were obtained. The information was collected during the first three weeks of April 2020.

**Analysis of data:** Initially, they are statistically described (totals and percentages) for both the sociodemographic variables and the variables associated with the knowledge and experience of the workers, later chi-square tests are performed to determine the variables that are related to the will and disposition to care for patients with COVID-19; Subsequently, graphs are obtained for the variables that result with a significant relationship in order to identify the meaning of said association. Finally, a logistic regression model is obtained to make predictions for workers who are willing to care for patients with COVID-19, based on their sociodemographic characteristics and the experience and knowledge they have of the pandemic. For carrying out the analyzes. Excel version 10 and the statistical software SPSS version 24 were used.

**Ethical approval:** All research was conducted with integrity and in line with generally accepted ethical principles. The survey was carried out in agreement with health personnel. All the personal information of the personnel involved is kept confidential, the informed consent and the protocol were in accordance with the ethical standards of the Declaration of Helsinki [19].

## Results

**Description of the variables:** Statistics on the availability and willingness of employees to serve patients with COVID-19 show that 204 employees are willing to provide care, which corresponds to 72%; while the remaining 28% do not have the will to care for patients with the virus.

According to Table 1, it is observed that more than 50% of the employees are under 30 years old (53.7%); while only 4.6% are over 50 years old. Regarding gender, very similar proportions are shown for males and females (40.99% and 59.01% respectively). For marital status, 44.17% are single and 55.83% live with someone or have previously had a conjugal marital relationship. The information collected shows that the highest proportions in the profession are found in nurses, nursing assistants and doctors (28.98%, 21.91% and 19.43%, respectively.); Among the less frequent professions are Bacteriologists, Physiotherapists and Pharmaceutical Chemists (2.12%, 2.83% and 0.71%, respectively). In relation to complementary training, it is observed that the majority of workers have completed courses for complementary (59.01%); while only 13.07% and 2.83% correspond to people who have completed specialization and master's degrees, respectively, as complementary preparation.

**Table 1: Description for the sociodemographic variables.**

| Variable | Modality | Total | Percentage |
|---|---|---|---|
| Age | 20 to 25 years | 68 | 24.03 |
| | 26 to 30 years | 84 | 29.68 |
| | 31 to 35 years | 44 | 15.55 |
| | 36 to 40 years | 37 | 13.07 |
| | 41 to 45 years | 24 | 8.48 |
| | 46 to 50 years | 13 | 4.5 |
| | 51 to 55 years | 7 | 2.47 |
| | 56 to 60 years | 4 | 1.41 |
| | <60 years | 2 | 0.71 |
| Gender | Male | 116 | 40.99 |
| | Female | 167 | 59.01 |
| Marital status | Married | 76 | 26.86 |
| | Separated | 3 | 1.06 |
| | Single | 125 | 44.17 |
| | Free Union | 79 | 27.92 |
| Profession | Nursing Assistant | 62 | 21.91 |
| | Bacteriologist | 6 | 2.12 |
| | Nurse | 82 | 28.98 |
| | Physiotherapist | 8 | 2.83 |
| | Surgical Instrumenter | 27 | 9.54 |
| | Doctor | 55 | 19.43 |
| | Pharmaceutical chemist | 2 | 0.71 |
| | Technician / Technologist in Pre-hospital Care | 41 | 14.49 |
| Complementary training studies | courses | 167 | 59.01 |
| | Graduates | 71 | 25.09 |
| | Specialization | 37 | 13.07 |
| | master's degree | 8 | 2.83 |

Table 1 shows the descriptive statistics for the variables associated with workers' knowledge and experience of the disease, showing that a significant percentage (56.18%) stated that they had completed previous training on COVID-19. The most frequent source of information used by workers is the internet (59.36%), followed by scientific journals (23.67%); while newspapers and radio are the least used for information (0.35%, each). With regard to experience, it is observed that only 37.87% of health personnel state that they have the necessary experience to care for patients with COVID-19. With regard to knowledge about the virus, understanding of the risks associated with it and knowledge about personal and patient care, it is observed that a high percentage of employees indicates that if they present such knowledge (80.21%, 92.23% and 85.16%, respectively).

**Table 2: Description for the variables associated with knowledge, experience and preparation in COVID-19.**

| Variable | Modality | Total | Percentage |
|---|---|---|---|
| You have completed a COVID-19 Pre-Training program | No | 159 | 56.18 |
| | Yes | 124 | 43.82 |
| Information sources were important to acquire knowledge about COVID-19 | Internet | 168 | 59.36 |
| | Newspapers | 1 | 0.35 |
| | Radio | 1 | 0.35 |
| | Scientific Journals | 67 | 23.67 |
| | Television | 46 | 16.25 |
| Has gained experience in treating and caring for patients with COVID-19 | No | 176 | 62.19 |
| | Yes | 107 | 37.81 |
| Has adequate knowledge of COVID-19 and protective measures | No | 56 | 19.79 |
| | Yes | 227 | 80.21 |
| You are sure you understand the risks of any epidemic for both patients and medical staff | No | 22 | 7.77 |
| | Yes | 261 | 92.23 |
| You are sure you know how to take care of yourself, your patients, and other staff during an epidemic | No | 42 | 14.84 |
| | Yes | 241 | 85.16 |

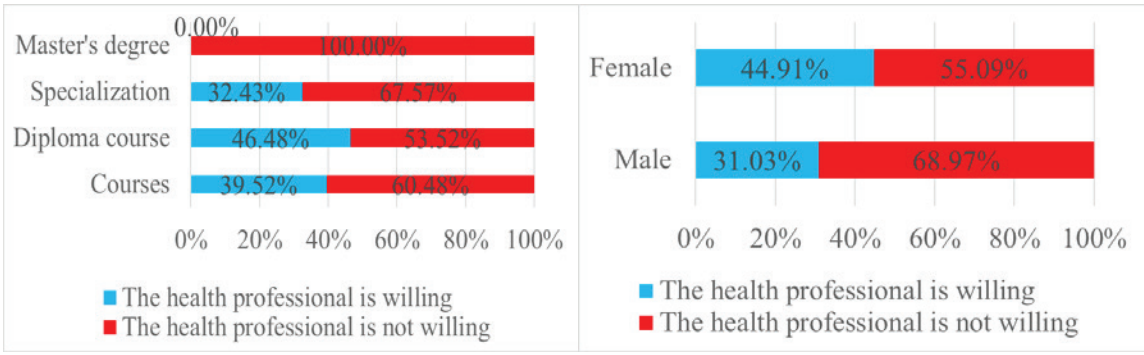
**Chi-square test:** Table 3 shows the results of the Chi-square test between the sociodemographic variables and the willingness to care for patients with COVID-19. These results show that the variables: Gender and complementary training studies show a significant relationship with the willingness and willingness to care for patients with COVID-19 (p-value <0.05); while the profession shows a highly significant relationship (p-value <0.01).

**Table 3: Chi-square test between sociodemographic variables and willingness to care for patients with COVID-19.**

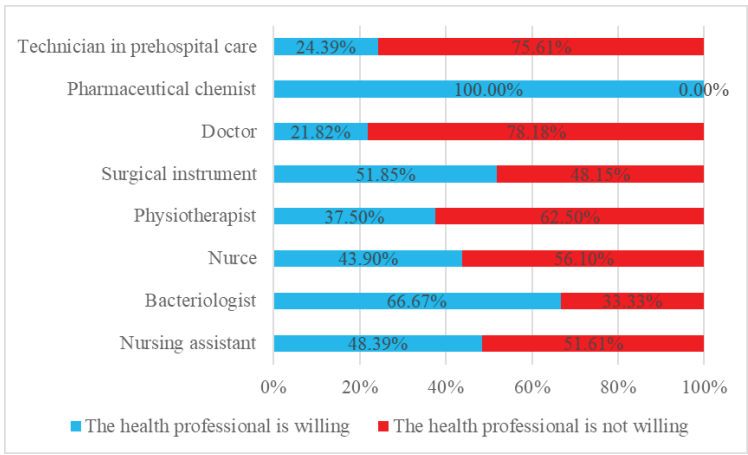
| Variable | Chi-square value | Degrees of freedom | p-Value |
|---|---|---|---|
| Age | 9.866 | 8 | 0.275 |
| Gender | 5.529 | 1 | 0.019** |
| Marital status | 2.014 | 3 | 0.569 |
| Profession | 24.671 | 8 | 0.002** |
| Complementary studies | 7.859 | 3 | 0.049* |

*: Significant relationship (p <0.05). **: Highly significant relationship (p <0.01)

Next, the mosaic graphs are shown in Figure 1 to observe the behavior of these relationships.




(a) Further training (b) Gender




(c) Profession

**Figure 1: Mosaic charts for the relationship between sociodemographic variables and the willingness and willingness to care for patients with COVID-19.**

The mosaic charts show that men show a higher percentage of workers willing to care for patients with COVID-19 compared to women; while workers with master's degrees and graduates are the most willing to care for patients with the virus. Regarding the profession, it is observed that pre-hospital care technicians, doctors and physical

therapists show a greater willingness to care for patients, the opposite occurs with pharmaceutical chemists, surgical instructors and bacteriologists showing a higher proportion of people who indicate that they are not willing to attend patients with COVID-19; while nurses and nursing aides do not show a determining profile.

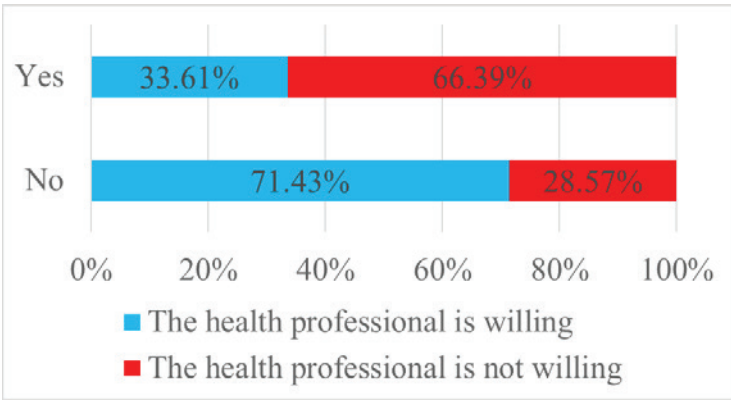
**Table 4: Chi-square test between the variables associated with knowledge, experience and preparation and the willingness to care for patients with COVID-19.**

| Variable | Chi-square value | Degrees of freedom | p-Value |
|---|---|---|---|
| You have completed a COVID 19 Pre-Training program | 16.664 | 1 | 0.000** |
| Information sources were important to acquire knowledge about COVID 19 | 13.615 | 4 | 0.009** |
| Has gained experience in treating and caring for patients with COVID19 | 20.353 | 1 | 0.000** |
| Possesses adequate knowledge of COVID 19 and protection measures | 21.112 | 1 | 0.000** |
| You are sure you understand the risks of any epidemic for both patients and medical staff | 11.233 | 1 | 0.001** |
| You are sure you know how to take care of yourself, your patients, and other staff during an epidemic | 21.459 | 1 | 0.00** |

*: Significant relationship ($p < 0.05$). **: Highly significant relationship ($p < 0.01$)

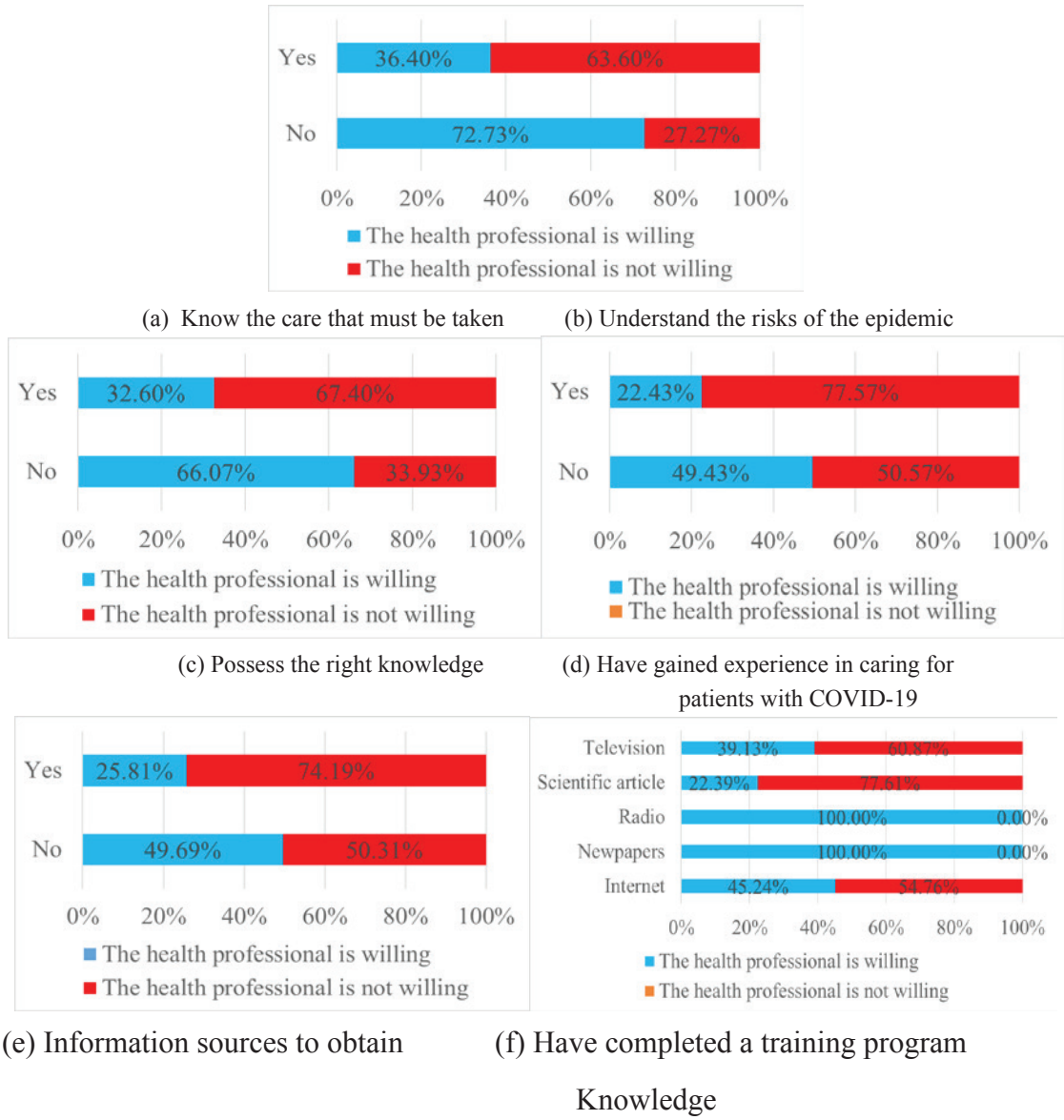
The Chi-square test given in Table 4 shows that all the variables associated with training, knowledge and experience about COVID-19 show a highly significant relationship with the willingness to care for patients with said virus (p values less than 0.01).

In Figure 2, the mosaic graphs for the associations between the variables related to knowledge and experience and the willingness to care presented by health workers are shown. The results




show that those who have completed training, have acquired experience in the care of COVID-19, have knowledge on the subject, understand the risks and know the proper care that must be taken, are characterized by showing a willingness to care for patients with COVID -19, like professionals who use scientific journals as an

information medium; while those who have reported COVID-19 in newspapers and radio tend to be unwilling to care for patients with the virus.




(a) Know the care that must be taken (b) Understand the risks of the epidemic

(c) Possess the right knowledge (d) Have gained experience in caring for patients with COVID-19

(e) Information sources to obtain (f) Have completed a training program

Knowledge

**Figure 2: Mosaic graphs for the relationship between variables associated with knowledge, experience and preparation and the willingness to care for patients with COVID-19.**

**Logistic Model:** Initially, a model was carried out where all the variables that were significantly related in the Chi-square test were considered with the variable "willingness and willingness to care for patients with COVID-19" and with the variables that were influential in this first model, a second model fits.

Table 5 shows the Logistic regression model to identify the conditions of the sociodemographic variables and of knowledge and experience that can influence the behavior of the disposition of employees in care during the emergency.

**Table 5: Logistic regression model for prognosis of willingness and willingness to care for patients with COVID-19.**

| | B | p-Value | Exp(B) | 90% C.I. for EXP(B) | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Position | | | | | |
| Nursing Assistant | -2.628 | 0.025* | 0.072 | 0.007 | 0.725 |
| Bacteriologist | -0.669 | 0.159 | 0.1512 | 0.202 | 1.298 |
| Nurse | -1.994 | 0.043* | 0.136 | 0.02 | 0.943 |
| Physiotherapist | -0.651 | 0.15 | 0.522 | 0.215 | 0.264 |
| Surgical Instrumenter | -0.815 | 0.364 | 0.443 | 0.076 | 2.574 |
| Doctor | 0.425 | 0.421 | 1.53 | 0.543 | 4.315 |
| Pharmaceutical chemist | -20.696 | 0.999 | 0 | 0 | 0 |
| Has not gained experience in treating and caring for patients with COVID-19 | -0.959 | 0.002** | 0.383 | 0.212 | 0.694 |
| Does not have adequate knowledge of COVID-19 and protection measures | 0.992 | 0.005** | 2.697 | 1.35 | 5.39 |
| Not sure you understand the risks of any epidemic for both patients and medical staff | -0.948 | 0.048* | 0.388 | 0.134 | 1.123 |
| Constant | 0.858 | 0.124 | 2.359 | 1.234 | 23.451 |

*: Significant relationship ($p < 0.05$). **: Highly significant relationship ($p < 0.01$)

## Discussion

The chi-square test shows that all the variables considered in knowledge and experience of care, are significantly related to the willingness to care for patients with the virus, showing that the lack of knowledge, preparation and experience definitely influences that workers show little will in providing the necessary accompaniment to infected patients. Previous studies have shown that the training of hospitals and related organizations plays a vital role in the prevention of infectious diseases[20]. Furthermore, it is important to empower health workers by supporting their ability to acquire and use evidence-based information[21]. Other studies have suggested that the implementation of appropriate education and protection measures improved the willingness of staff members to work[22].

Finally, within the limitations of the study, we have that we could not exclude the possible impact of selection bias. However, we registered the participants through WhatsApp, the most used social tool in Colombia, which has a powerful network of friends. This allows questionnaires to be administered through WhatsApp using a convenient sampling method[23]. Similarly, the results of this study are based on a self-reported questionnaire. Previous studies have suggested that self-reported practice may not represent actual practice[20]. Therefore, more research is needed to confirm the findings of this study.

## Conclusions

With this work it can be concluded that a trained and prepared staff is required to face the pandemic in health institutions. This preparation must be in the mental, knowledge and physical spheres, equipping health personnel with the necessary tools to face the health situation; with an institutional and individual co-responsibility of each professional. The lack of security and knowledge of the disease leads to the personnel who maintain direct contact with patients, expressing fear of being infected during their performance (nursing assistants and professional nurses); in addition, because they are not provided with adequate PPE for care. The results of this study reveal that training, information and practice to gain experience are essential in the different health professions; but that the disposition, the will and the vocation to the service, are not sufficient when the security measures are not guaranteed and affect the quality of care for patients diagnosed positive with COVID-19.

**Conflict of Interest:** Nil

**Source of Funding:** Self-funding

**Ethical Clearance:** Obtained from the Declaration of Helsinki

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