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# INTERVENTION OF A DISTRICT HOSPITAL IN THE FIGHT AGAINST THE COVID-19 PANDEMIC

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**Abstract: Introduction:** The SARS-CoV2 coronavirus (COVID-19) required adaptation from healthcare professionals, with specific interventions and measures to reduce the transmissibility of the disease.
**Objective/s:** Evaluate the intervention of the District Hospital in the center of the country in the fight against COVID-19;
**Methods:** Quantitative, retrospective and descriptive study with 430 users, from March 2020 to March 2021
**Results:** HD1's intervention was important in the treatment of users positive for COVID-19, requiring hospitalization. Through the use of treatments using non-invasive ventilation, a greater number of transfers to the ICU and deaths were avoided
**Conclusion:** HD1 had a significant intervention, allowing general urgency and respiratory urgency triage. The majority of people with an episode of respiratory urgency did not test positive for COVID-19. The majority of users who were positive for COVID-19 did not require hospitalization and those who required hospitalization were discharged from the hospital.
**Keywords:** COVID-19; hospitalizations; Health professionals; nursing.

## INTRODUCTION

Fear spread throughout the world, thanks to the disclosure of the presence of a virus called COVID-19, previously unknown and which could have a major impact on the health of the population. This unknown virus acted very quickly, unpredictably and with high transmissibility. Transmission occurred from person to person, through respiratory droplets and over greater distances, through droplet nuclei in the air (World Health Organization, December 2020). Concern about the severity of the COVID-19 infection, evidenced by the high risk of lethality in populations at risk (elderly, immunocompromised, obese, diabetics and those with lung, heart or oncological diseases) and the rapid progression of the disease, culminated in the high need for ventilatory support and the inevitable increase in the number of deaths throughout the world. This required a quick response from the WHO and the pharmaceutical industry, to try to stop this fearful disease (World Health Organization, December 2020). On January 30, 2020, the World Health Organization (WHO) declared the outbreak of COVID-19 – a disease caused by the new coronavirus (SARs-CoV – 2), as an international Public Health emergency. On March 11, 2020, COVID-19 was considered by the WHO to be a pandemic, given the geographic distribution of regions affected by COVID-19. (Pan American Health Organization, 2020). Since then, many countries have implemented a series of interventions to halt the progression of virus transmission (Pan American Health Organization, 2020). The District Hospital in central Portugal (HD1), the site of this study, was no exception and quickly adopted several measures, which turned out to be fundamental for controlling the pandemic. The year the study was carried out was marked by uncertainty, fear of the unknown and the hope of returning to normality. The new coronavirus SARS-CoV-2 hit the world with a new reality, forcing healthcare professionals to quickly adapt their healthcare to this new disease, COVID-19. Due to its characteristics, it became a priority to ensure that the equipment essential for preventing and combating the new coronavirus would always be available for healthcare professionals to provide the best safe care. Personal Protective Equipment (PPE) is one of the essential elements and only its appropriate use can simultaneously guarantee the total protection and safety of healthcare professionals. Several pieces of equipment were also purchased to reinforce our intervention capacity in relation

to this disease, such as a portable X-ray device, several monitors, multiparameters and 8 non-invasive ventilators. Of particular note is the acquisition of materials and equipment for the Clinical Pathology service, more specifically in the area of Molecular Biology, which allowed testing of the SARS-CoV-2 virus to be carried out internally, avoiding the increased waiting times for results, which was observed when these were forwarded to external entities. In addition to these adaptations, the hospital carried out several interventions with the aim of improving the safety conditions of the care provided and, whenever necessary and possible, the autonomy of the care and treatment circuits for COVID/non-COVID patients.

The study aimed to understand the role that HD1 and its 112 healthcare professionals played in combating COVID-19.

The World Health Organization (2019) gave the name COVID-19 to the disease that results from the words "Corona", "Virus" and "Disease" indicating the year in which it appeared.

Coronaviruses are a family of viruses known to cause disease in humans. The infection can be similar to a common flu syndrome or present as a more serious illness, such as pneumonia. As it is an agent of respiratory infection, the coronavirus is most frequently transmitted by aerosols and droplets of respiratory secretions. Transmission of the virus through contaminated objects and surfaces can occur, but in a more limited way, as these microorganisms are sensitive to dryness and humidity and are not viable in the environment for long periods of time (sns24.gov.pt). Infected people may present signs and symptoms of acute respiratory infection such as fever, cough, difficulty breathing, muscle pain, tiredness, headache, total or partial loss of smell (anosmia), weakening of taste (ageusia) or disturbance/reduction of taste (dysgeusia) of sudden onset (sns.gov.pt). In more severe cases, it can lead to severe pneumonia with acute respiratory failure, kidney failure, multiorgan failure and consequent death. Treatment for COVID-19 infection is directed at the signs and symptoms presented. To date, considering current scientific knowledge and WHO recommendations, some therapeutic strategies identified as potential therapeutic candidates are under investigation. The laboratory detection of COVID-19 is carried out using the nucleic acid amplification methodology, using the polymerase chain reaction (PCR). The PCR consists of three amplification reactions directed at two different regions of the viral genome, and a confirmed case will present all three positive PCR reactions. Severe forms of COVID-

19 can affect healthy individuals of any age, but occurs predominantly in the elderly or people who have pre-existing health problems, especially if they have poor control. The main risk factors associated with severe forms of COVID-19 are: Cardiovascular diseases (such as high blood pressure); Diabetes mellitus; Chronic lung diseases; Immunosuppression; Obesity; Chronic kidney disease; Chronic liver disease. Most people who contract COVID-19 have mild to moderate symptoms and recover without needing special treatment. However, some become seriously ill and require medical assistance and subsequent hospitalization (sns24.gov.pt).

## MATERIALS AND METHODS

How important is a District Hospital in the fight against COVID-19?

H1: There is a relationship between the number of positive cases for COVID-19 and the number of hospitalizations in HD1;

H2: There is a relationship between the number of hospitalizations in HD1 and the number of transfers to intensive care units;

H3: There is a relationship between the


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number of hospitalizations and the number of deaths;

To answer the research question, a quantitative, 166 retrospective and descriptive study was designed. The following objectives were defined: to evaluate the importance of a District Hospital in the fight against COVID-19, from March 2020 to March 2021; describe the series of positive patients with COVID-19 admitted to the hospital under study; understand the severity of the disease in hospitalized patients; understand the importance of using non-invasive ventilation and high-flow therapy in combating COVID-19 disease.

The variables under study were defined as: sociodemographic variables; age, sex; 174 date of admission; risk factors; treatment carried out; high destination;

### *SAMPLE / PARTICIPANTS / INFORMANTS / SAMPLE CORPUS*

The sample consists of the number of hospitalizations due to COVID-19 at the District Hospital (HD1) in the period between March 2020 and March 2021. Inclusion criteria were defined as the hospitalization of users over the age of 18 with a diagnosis of COVID-19. 19 in the period between March 2020 and March 2021.

### *DATA COLLECTION INSTRUMENTS*

The data collection instrument consisted of consulting the HD1 database and consulting the clinical files of patients hospitalized for COVID-19 under study, referring to the period from March 2020 to March 2021.

### *PROCEDURES*

All statistical treatment was processed using the IBM-SPSS 23.0 (Statistical Package for the Social Sciences) program, version for Windows®. The project was submitted to the HD ethics committee, authorization to consult the institution's database and consultation of the clinical files of the users under study, and a favorable opinion was obtained. Ethical issues were safeguarded, such as the right to confidentiality and anonymity of the users involved, and it was not possible to identify them. This investigation did not cost any users involved, nor HD1. The right to non-maleficence was guaranteed, there was no harm or harm to the users involved in the study.

## RESULTS

The sample consists of 430 hospitalized users who tested positive for COVID-19, in the period between March 2020 and March 2021. Figure 1 shows the number of episodes in respiratory emergency (5023), the number of users who tested positive for COVID-19, without the need for hospitalization (1329) and the number of users who tested positive for COVID-19 and required hospitalization (430). It can be seen that the months with the greatest influx of respiratory emergency patients were from October 2020 to February 2021. The months with the highest flow of users to the emergency service coincide with the months with the highest number of hospitalizations, with the exception of the month of October 2020. However, it appears that the majority of users who tested positive for COVID-19 do not require hospitalization, as they were asymptomatic or had mild symptoms: fever, cough, loss of smell and taste. These months have already been critical months in other years when it comes to respiratory diseases. However, after a detailed analysis of the clinical files, it was found that cases with a positive test for COVID-19 were more serious and required a greater number of transfers to intensive care. It appears that March, April, May and June 2020 did not have a major impact on the number of hospitalizations, going against the numbers in

other European countries such as Spain and Italy. The months of July and August do not present hospitalizations, because a protocol was carried out with a central hospital in the center of Portugal (HC) to transfer positive patients to their institution. However, in September 2020, given the increase in the number of positive cases of COVID-19 in the central area, HD1 began to ensure the hospitalization of positive users who resort to the Respiratory Emergency with hospitalization needs.

Analyzing the results obtained for COVID-19 Positive cases, it was found that these occurred in both males and females, with an average age of 73.27 years. Results shown in the following graphs.

Observing the results obtained, it appears that the critical months in terms of deaths were: November and December 2020 and January and February 2021. There is also the occurrence of a greater number of deaths in females.

Regarding the characterization of users who worsened their general health condition and were transferred to intensive care units, there were a total of 34 users. There were 13 female transfers (11 transferred to the HC and 2 to another District Hospital in the central area (HD2)) and 21 male transfers (18 to the HC and 3 to HD2).

With regard to the characterization of users transferred to intensive care units by age, it was found that: patients aged between 50-59 and 70-79 were the most transferred from the HD1 COVID 1 service to units of intensive care. The male gender was transferred in greater numbers (21) than the female gender (13).

Regarding the relationship between the use of non-invasive ventilation equipment, it was found that 64 patients hospitalized during the study period were prescribed non-invasive ventilation and high-flow therapy. Of the 64 patients who underwent this treatment, 34 worsened their clinical status and were transferred to intensive care units, 18 improved and were discharged with significant improvements in their health status, 12 worsened their clinical status, ultimately resulting in death.

## DISCUSSION

Taking into consideration, the sample of the present study, the previously raised hypotheses were tested, with the aim of verifying whether these differences are statistically significant. Using the Mann-Whitney test, it was verified that there is a statistically significant difference ($p < 0.05$) between the number of positive cases for COVID-19 in Portugal and the number of hospitalizations in HD1. Regarding the number of admissions to HD1 and the number of transfers to intensive care units, it was verified through the Mann-Whitney test that this relationship is statistically significant. Regarding the number of deaths, also using the Mann-Whitney test it was found that there is a statistically significant relationship between the number of hospitalizations and the number of deaths. As limitations of the study, we consider that the study period, if it were longer, would have a greater impact on the study.

## CONCLUSION

The present study reveals that HD1 and its professionals played a leading role in combating the COVID-19 pandemic, providing excellent and highly complex healthcare to 430 users from March 2020 to March 2021, thus contributing for recovery and on the other hand freeing up resources in the most differentiated health units. It was found that the majority of people who used the respiratory emergency service did not test positive for COVID-19. As for users positive for COVID-19, the majority did not require

hospitalization. In the months of October 2020 to February 2021, there was the highest number of users admitted to HD1. These hospitalizations occurred in male and female patients almost equally, with an average age of 71.27 years. Regarding the characterization of users who worsened their general health condition and were transferred to intensive care units, there were a total of 34 users, the majority of whom were male users (21). The average age where the most transfers occurred (11) was between 70 and 79 years old. The use of non-invasive ventilation therapy has become a complete weapon in the fight against this pandemic, allowing a large number of users to not be subjected to invasive mechanical ventilation. Observing the results obtained, it appears that the critical months in terms of deaths were: November and December 2020 and January and December 2021. There is also a greater number of deaths among females. It was found that there is a statistically significant relationship between the number of positive cases in Portugal and the number of hospitalizations in HD1, the number of hospitalizations and the number of deaths, as well as a statistically significant relationship between the number of hospitalizations in HD1 and the number transfers to intensive care units. Given the results, it is considered that health planning was fundamental, such as: establishing priorities, managing stressful situations, managing stocks and not taking anything for granted, these are aspects that the COVID19 pandemic made us take into consideration. Thus, nurses, due to the specific skills they possess, have acquired a preponderant role in the treatment and prevention of the spread of the COVID-19 virus.

19. The explanation of this topic made us more aware of the importance of the nurse's role in the treatment and referral of these users. The nurse has a very active role in the admission, monitoring, treatment and subsequent discharge of users infected with COVID-19, as well as in caring for patients' inter-hospital transfers. The value of health gained greater importance among the world's population, in HD1's COVID 1 Service, nurses acquired a fundamental role in promoting health and health education for the positive evolution of users hospitalized in the context of COVID-19 infection. All of this required effective planning, the ability to diagnose, target and implement quality measures/strategies, in order to guarantee the best treatment for hospitalized users. The investigation turned out to be fruitful, making it possible to reveal the role of HD1 in controlling the COVID-19 pandemic.

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