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PERCEPTION OF THE INFLUENCE OF THE COVID-19 PANDEMIC ON ISCHEMIC STROKE IN THE VIEW OF HEALTH PROFESSIONALS, PATIENTS AND FAMILIES

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Abstract: Stroke is a major cause of sequelae and mortality worldwide. The aim of the study was to investigate the perception of the influence of the COVID-19 pandemic on stroke. The methodology used was observational, longitudinal and of a mixed approach, within the line of research within the Social Sciences and Epistemology in Health. Data was collected in two private hospitals in 2022. Patients diagnosed with acute ischemic stroke, their families, doctors and nurses took part in the study. A data collection form and interviews were used for each participant semi-structured. Quantitative data was analyzed using SPSS *software*, and qualitative data using IRAMUTEQ. Data was collected from a total of 19 patients, 19 family members, 19 doctors and 19 nurses. Among the results found, the average age of the patients was 72± 13 years and 52.6% were male, 57.9% were married and 68.5% had at least a high school education. As for the qualitative data, stress was considerably prevalent in interviewees' perceptions (patients, family members and doctors and nurses), contributing to the study patients' strokes, rather than the "COVID disease" itself.
Keywords: Stroke, Ischemic stroke, Pandemic, COVID-19

INTRODUCTION

Cerebrovascular Accident (CVA) is a sudden disease that is an important cause of death and sequelae in Brazil and worldwide (ALMEIDA, 2012; AQUINO et al., 2020). From a pathophysiological point of view, it is divided into ischemic (due to interruption of blood flow in the vessel) or hemorrhagic (due to extravasation of blood) (CAPLAN, 2009), with the ischemic type being responsible for around 85% of stroke cases (AQUINO et al., 2020).

In 2020, the rapid spread of COVID-19 around the world, which has become a pandemic, has directly affected care for Chronic Non-Communicable Diseases (WHO, 2020), by interrupting many health services for chronic diseases, as well as compromising demand for them, for fear of contracting the virus.

In stroke care, an overall reduction in admissions and hospitalizations for stroke (both ischemic and hemorrhagic) was observed, leading to the hypothesis that people are afraid of contracting COVID when they leave the house (NOGUEIRA et al., 2021).

The reduction in demand for and availability of health services for stroke, whether for acute care or prevention of its risk factors, has had an impact on the increase in cases. In addition, an increase in stroke cases has been reported, attributed to COVID-19. In a meta-analysis of 26,691 people, one of the main hypotheses for COVID-19-related ischemic stroke was the inflammatory effect of the virus (LUO et al., 2022).

Against the backdrop of doubts about the biological and psychosocial factors in the relationship between the *SARS-CoV-2* virus and stroke, there was a need to directly study stroke patients and their families, as well as to listen to the experiences and impressions of the professionals involved in their care.

The aim of this study is to describe the perception of doctors, nurses, patients and their families about the influence of the COVID-19 pandemic on ischemic stroke (ICH) in two hospitals.

The COVID pandemic has led to hypotheses about its influence on various aspects of health, including neurological diseases. This study, unlike most, seeks to align the experience of those directly involved, within scientific methodology.

METHOD

This is an observational, longitudinal, exploratory and descriptive study, based on mixed approach (quantitative and qualitative). The research was carried out in two private hospitals, considered to be of high complexity, in the Brazilian capital of the state of Ceará, Fortaleza - Hospital São Carlos and Unimed Regional Hospital.

Patients diagnosed with acute stroke (with onset of the condition within 72 hours prior

to hospitalization, through clinical and neuroimaging), over 18 years of age, made up a non-probabilistic, purposive sample and their families (accompanying persons), after reading and signing the Informed Consent Form (ICF). As a way of equalizing the data,

All patients had to be Unimed users. Medical professionals seen as patients' assistants and nurses from the treatment unit also took part, after the patients had been recruited and had signed an informed consent form. All those interviewed were approached from the 3rd day of hospitalization onwards, as before this period patients are generally more fragile and uncertain about their clinical condition.

Data collection took place from April to December 2022, with 10 patients, 10 family members, 10 doctors and 10 nurses from Hospital São Carlos and 9 patients, 9 family members, 9 doctors and 9 nurses from Hospital Regional da Unimed being studied, totaling 76 participants in four categories. This number was based on estimates of hospitalizations in the year prior to data collection.

The data was collected from the patients' medical records and semi-structured interviews with them, their families (companions), doctors and nurses who accompanied their interaction. The instruments are part of the researcher's Master's dissertation.

Quantitative data was collected from the patient's medical records, which included demographic data, a physical examination and complementary tests. The qualitative data came from a semi-structured interview recorded on video. The question assessed in this study was:

To the patient: *Do you believe that the COVID-19 pandemic influenced the stroke you had?* If so, ?

To the family member: Do *you believe that the COVID-19 pandemic influenced the stroke you had? If so, in what way?*

To the healthcare professional: Do *you believe that the COVID-19 pandemic influenced the stroke you had? If so, in what way?*

Patients who were unable to speak had their interviews recorded, with the consent of their guardian, and their body expressions and vital signs were assessed.

The data was statistically analyzed using absolute counts and relative frequencies in percentages and analyzed using the *Statitcal Package of the Social Science (SPSS) software.* Comparisons were made between the groups using the chi-square test and Fisher's exact test. Hospitals were not compared with each other, due to the confidentiality of the place where patients were interviewed. Normal continuous data was expressed as mean ± standard deviation and non-normal data as median and inter-quartile range (IQR).

The interviews were transcribed and the data entered into the *software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRAMUTEQ). The interviewees were given the codenames Patient (P1 to P19), Family Member (F1 to F19), Doctor (M1 to M19) and Nurse (E1 to E19), all of whom were listed in order to ensure their anonymity and confidentiality.

The research followed the rules contained in Resolution No. 466 of December 12, 2012, which sets out the Guidelines and Regulatory Standards for Research Involving Human Beings (BRAZIL. MINISTÉRIO DA . CONSELHO NACIONAL DE SAÚDE, 2013). It was also in accordance with with Resolution No. 510, of April 7, 2016, which provides for the rules applicable to research in the Humanities and Social Sciences (BRASIL. MINISTÉRIO DA SAÚDE. NATIONAL HEALTH COUNCIL ÚDE, 2016). It was carried out with the formal consent of the participants, with patients, family members and health professionals reading and signing the ICF.

The study was approved by the Ethics Committee of the University of Fortaleza (UNIFOR), under Report No. 5.287.094, and by the Ethics Committee of the São Carlos Hospital, under Report No. 5.328.578. The documents were sent

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to the Unimed Regional Hospital Study Center and field research began after approval.

RESULTS

QUANTITATIVE DATA

We included 19 patients who had suffered a stroke, their 19 family members, 19 doctors and 19 nurses, for a total of 76 participants.

The average age of the patients was 72± 13 years and 52.6% were male, 68.5% had at least a high school education; 57.9% were married and 68.5% considered themselves Catholics.

The majority of family members were female (78.9%), with an average age of 47 ± 17 years, and with an education level equal to or above high school (94.7%). Parents were mainly children (36.8%), followed by spouses (26.3%) and grandchildren (15.8%).

	Patients studied (n=19)
Hospitalization	
São Carlos Hospital	10 (52,6)
Unimed Regional Hospital	9 (47,4)
Patient's age, years	**72± 13**
Patient's gender	
Female	9 (47,4)
Male	10 (52,6)
Patient's schooling	
Not informed	1 (5,3)
illiterate/doesn't have	2 (10,5)
Incomplete primary education	1 (5,3)
Complete primary education	2 (10,5)
Middle Level	6 (31,6)
Incomplete university degree	1 (5,3)
Complete university degree	5 (26,3)
Postgraduate/PhD	1 (5,3)
Patient's marital status	
Single	1 (5,3)
Married	11 (57,9)
Divorced	2 (10,5)
Widowed	5 (26,3)

Table 1. Profile of patients hospitalized for stroke. Fortaleza, Ceará Brazil, 2022

Categorical data expressed as absolute counts and relative frequencies in percentages in brackets. Continuous data expressed as mean ± standard deviation or as median and interquartile range in brackets.

Source: Research data (2022).

	Patients studied (n=19)
Age of companion, years	47± 17
Sex of the escort	
Female	15 (78,9)
Male	4 (21,1)
Companion's schooling	
Complete primary education	1 (5,3)
Middle Level	5 (26,3)
Incomplete university degree	3 (15,8)
Complete university degree	7 (36,8)
Postgraduate/PhD	3 (15,8)
Companion's marital status	
Single	6 (31,6)
Married	9 (47,4)
Divorced	2 (10,5)
Widowed	1 (5,3)
Stable union	1 (5,3)
Companion's parenting	
Spouse	5 (26,3)
Child	7 (36,8)
Grandchild	3 (15,8)
Brother	2 (10,5)
Nephew	1 (5,3)
Maid of honor	1 (5,3)

Table 2. Profile of relatives of patients hospitalized for stroke. Fortaleza, Ceará Brazil, 2022

Categorical data expressed as absolute count and relative frequency in percentages in brackets. Continuous data expressed as median and interquartile range in brackets.

Source: Research data (2022).

As for the general profile of the doctors interviewed, 63.2% were male, with an average age of 39 ± 10 years and the majority (84.2%) were married.

As for the nurses, 94.7% were female and 47.4% were single and 52.6% married. In addition, nurses had an average age of 36 ± 7 years.

	Patients studied (n=19)
Doctor's age, years	39± 10
Sex of the doctor	
Female	7 (36,8)
Male	12 (63,2)
Doctor's marital status	
Single	1 (5,3)
Married	16 (84,2)
Divorced	2 (10,5)
Nurse's age, years	36± 7
Nurse's gender	
Female	18 (94,7)
Male	1 (5,3)
Nurse's marital status	
Single	9 (47,4)
Married	10 (52,6)

Table 3. Profile of doctors and nurses who treated patients hospitalized for stroke. Fortaleza, Ceará Brazil, 2022

Categorical data expressed as absolute count and relative frequency in percentages in brackets. Continuous data expressed as median and interquartile range in brackets.

Source: Research data (2022).

On the day of the interview, no patient had reported COVID-19 infection during the hospitalization period, however 9 patients (47.4%) had already had this history since the pandemic and 100% of the patients interviewed had received at least two doses of the COVID vaccine.

QUALITATIVE DATA

ANALYSIS OF PATIENT INTERVIEWS

The interviews were closed due to saturation. Thus, 13 participants took part in the IRAMUTEQ analysis, as patients with significant speech or sensory alterations could not be included in this textual *corpus* analysis.

The presence of the word "no" was observed, as well as a limited vocabulary, due to the difficulty in expressing themselves as a result of the stroke.

In terms of the perception of the possible influence of the pandemic on COVID-19, it was seen:

> ***I also worked*** *during the pandemic with Covid patients.* ***I worked*** *directly with them.* ***I think*** *that* ***tension, fear****, the unknown since the first pandemic may have influenced something."* (P4)

> I don't think so. *(P9)*

> *During that period I didn't leave the house for anything.* ***Afraid****,* ***afraid*** *not to catch this Covid thing, because I* ***lost****, I, I* ***lost*** *an uncle who* ***we liked a lot****,* ***we used to travel****.* (P13)

ANALYSIS OF FAMILY INTERVIEWS

The interviews of 19 participants were analyzed. Only one person was a companion, but she had been living with the patient in a close relationship for a long time and was included in the study.

The most frequently observed statements were related to the stress caused by the pandemic. And then, not perceiving a relationship. No interviewee perceived a pathophysiological relationship between COVID-19 and the stroke acquired by the patient.

> *I think so, [...] he spent practically the whole* ***pandemic*** *at home. So he didn't have any contact with his* ***family****, he practically stayed at home, on his own. (F1)*

> ***He worked*** *on construction sites,* ***traveled*** *all the time. [...] I* ***think*** *he's great.* ***Today*** *I feel he's fine, but he's a* ***very*** *aggressive* ***person****,* ***perhaps*** *because of the* ***pandemic*** *we've been through.* (F2)

> *I* ***don't*** *think so. I can't understand that, a* ***covid*** *or vaccine situation, that sort of thing." (F13)*

ANALYSIS OF THE DOCTORS' INTERVIEWS

Nineteen doctors took part in individual semi-structured interviews. The interviewees commented that the COVID-19 pandemic had influenced their patients' strokes by making it difficult for patients to access their routine health care, in addition to the problems caused by social isolation, such as deprivation of physical health and mental disorders.

> *I **think** the **COVID pandemic** may have had **an influence**, especially on the **lack of** primary care. I **think** it has **contributed**.*" (M1)

> ***Probably** due to a decrease or **lack of follow-up** his case. The patient has heart disease, may have lost **follow-up**, may have changed their habits and this has **contributed a lot** in patients who have intractable chronic diseases and this can make them worse in the long term.* (M9)

> *He has **many** factors. I can't **say**, I don't **think** so, because he **already** has everything that **causes strokes**: obesity, hypertension, diabetes and atrial fibrillation.* (M18)

ANALYSIS OF THE NURSES' INTERVIEWS

With regard to nursing's perception of the influence of the COVID-19 pandemic on the patient's stroke, the statements highlighted the psychological problems that social isolation due to COVID caused the patient, and some of the statements mentioned the influence on the stroke suffered.

> *I believe **so**. [...] I **think** that in the long term the patients **have become even more**, it's not just the patient as a whole, but the **issue of stress**, the **issue of** hypertension itself, everything carries, stress, situations of being very nervous, isolated. I believe thats the point.*" (E1)

> *Many people, **especially the** elderly, have **become very** distant from their families. **So** all this change **in everyone**'s life, I **think**. a lot of people, a lot of people's lives **influenced** the emergence of various illnesses, **especially** psychological ones. **So** this period was **very** complicated.*" (E13)

> *[...] I **think** it may have **influenced** the issue, more stress than, like, the consequences of the vaccine.*" (E17)

DISCUSSION

The average age of patients was 72 ± 13 years and 52.6% were male, in line with the literature (COSTA; ROMEO, 2021; LOTUFO et al., 2017), which also describes a higher number of deaths between 1990 and 2015 in males over the age of 70.

Of the patients studied, 57.9% said they were married and 68.5% had at least a high school education. The literature found an inverse relationship between schooling (COSTA; ROMEO, 2021), which is different from this study, which may be due to the that the study focused on private hospitals in the state capital. This observation suggests that an epidemiological evaluation should also be carried out in public hospitals.

The age range of doctors was higher than that of nurses, which is in line with updated demographic data, which cites a younger population among nursing professionals. The study pointed to data compatible with national and world literature, with a large majority of females (DE OLIVEIRA et al., 2020). In the latest medical demographic census of 2023 (SCHEFFER, 2023), the sex ratio among these professionals is almost 1:1 and in this study the majority were male. It should be noted that this same census revealed a higher proportion of male doctors for patients with specialties such as intensive care and neurology.

A meta-analysis of 14 studies involving 10,130 patients found that perceived (self-reported) psychosocial stress is a modifiable and independent risk factor for both acute and hemorrhagic stroke (BOOTH et al., 2015). Data from INTERSTROKE, an international case-control study of risk factors for first-ever stroke, suggest that greater stress control is related to a lower risk of stroke and is an important risk reduction factor (REDDIN et al., 2022).

Stress was considerably prevalent in the speech and perception of those interviewed (patients, family members and doctors and nurses), contributing to the stroke of the patients in the study. During the pandemic, studies have reported an increase in the prevalence of stress and mental disorders, such as depression, anxiety and panic. The COVID-19 pandemic has had repercussions on collective and individual health worldwide (PFEFFERBAUM; NORTH, 2020).

The study did not use scales to measure the stress levels of the participating patients. The answers to the interviews were spontaneous and did not try to influence the expression of their perception.

The interviewees pointed to the change in routine, tension and worry about the pandemic as factors associated with stroke. In Brazil, there have been studies to assess the mental health of Brazilians during the pandemic. A study carried out in 2020, with a sample of 3,233 Brazilians, found high rates of stress, anxiety, depression and panic, with uncertainty in the actions of government officials, fear of contamination and financial issues as stressors (EMMANUEL; LIPP; MARIO, 2020).

The general perception was not of the "COVID disease" itself influencing the stroke, but of the difficulty in continuing with treatment and control tests, that is, having access to health services, as reported in WHO (2020), in addition to the stress resulting from uncertainties about the disease and social isolation. This highlights the importance of managers paying attention to their regional networks for maintaining stroke care for future pandemics or crises (NOGUEIRA et al., 2021).

CONFLICT OF INTEREST

This article was the result of a Master's dissertation by one of the authors. She works in the hospitals under study. No patients were interviewed in which he acted as an assistant professional during her hospitalization at any stage of the research. The other author has no conflict of interest.

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