

ORIGINAL RESEARCH

“Hanging on by a thread.” Cognition and emotions in Medical Personnel during the COVID 19 Pandemic in Chihuahua, Mexico

“La vida en un hilito”. Cognición y emociones en el personal médico durante la pandemia de COVID 19 en Chihuahua, México

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Abstract

The experiences of the medical personnel of the central university hospital of Chihuahua during the Sars-COV2 pandemic are analyzed. To understand the anthropological relationship between cognition and emotions, a qualitative methodology was used, based on the conduction and interpretation of semi-structured interviews. The verbal testimonies of the physicians were analyzed for the ways in which they solved problems of different natures within the hospital, demonstrating the emergence of social and collaborative learning processes. In relation to their emotional experience, it was determined that emotions affect their performance, but, at the same time, emotional intelligence allowed them to understand the pandemic as an opportunity to learn non-technical skills, for example, thinking in humanitarian terms and using collaborative organization. It was concluded that the physicians, based on their socio-cognitive and emotional capacities, were able to learn to perform under social guidelines, in accordance with the goal of facing the pandemic and solving day-to-day problems in their medical practice, demonstrating high physical and emotional resilience.

Keywords: Pandemic, cognition, emotions.

Resumen

Se analizan las vivencias del personal médico del hospital central universitario de Chihuahua durante la pandemia de Sars-COV2. Con el objetivo de entender la relación antropológica entre cognición y emociones. Se utilizó una metodología cualitativa, basada en la conducción e interpretación de entrevistas semiestructuradas. Se analizaron los testimonios verbales de los médicos, sobre las formas en que solucionaron problemas de diversa naturaleza dentro del hospital, demostrando la emergencia de procesos de aprendizaje social y colaborativo. En relación, a su experiencia emocional, se determinó que las emociones afectan su desempeño, pero, al mismo tiempo, la inteligencia emocional, les permitió comprender la pandemia como una oportunidad de aprendizaje de habilidades no técnicas, por ejemplo, en términos humanitarios y de organización colaborativa. Se concluyó que los médicos(as), basados en sus capacidades sociocognitivas y emocionales, lograron aprender a desenvolverse bajo pautas sociales, acordes en congruencia con la meta de enfrentar la pandemia y resolver los problemas del día a día en su práctica médica, demostrando alta resiliencia física y emocional.

Palabras clave: pandemia, cognición, emociones.



Introduction

During the Sars-COV2 pandemic, a public health crisis was experienced around the world. In this crisis hospitals and health personnel played a fundamental role. Medical care required logistical strategies to serve the population efficiently and quickly. Doctors acted quickly to save as many lives as possible. For many doctors and nurses, the pandemic represented the most important professional challenge of their careers.

In most countries, young doctors were hired with little experience in intensive care medicine, but they were needed to meet the demand.¹ In Mexico, a program called Health Heroes was created. In this program, they hired thousands of doctors who supported specialists in respiratory diseases and internists.

The Mexican government ordered the renovation of hospitals throughout the country. This meant creating exclusive hospitals to care for COVID patients, using the facilities of hospitals that already existed.² This involved reorganizing logistically and learning new knowledge quickly. As in the rest of the world, doctors had to adapt quickly to the constantly changing information that was emerging about the therapeutic management and treatments of COVID patients.³

This is an interdisciplinary work composed of two doctors and three anthropologists (two female and one male). Our study perspective is based on the theoretical integration of cognitive anthropology and the neuroscience of emotions. Specifically, we analyze the learning strategies of doctors during the pandemic and the role emotions played in this process. We revisit the concept of cultural and social learning, that is, socially mediated processes that allow us to learn collectively through direct observation, imitation, directed teaching, and collaboration.⁴⁻⁶

We understand cognitive processes as a system composed of neural, social, and bodily factors.⁷⁻¹⁰ We conceive of emotions as the integration of embodied cognitive and social processes that vary according to the experience of the subjects.⁸ On the other hand, emotional intelligence refers to the ability to identify our emotions and those of others, to regulate our understanding of them and adapt to the underlying changes of social life.^{11,12}

Background

Studies on emotions and cognition in hospitals indicate that the pandemic created a niche for accelerated learning.^{13,14} This cognitive demand had an emotional and psychological cost, named COVID stress syndrome.^{15,16} Doctors experienced this stress, impacting their physical and emotional health.¹⁷ However, they achieved emotional and cognitive resilience, allowing them to perform their work in the best way possible. Resilience refers to the quality of some people to overcome adversities positively.

Warren *et al.*,¹⁸ in a study on the experiences and perceptions of intern doctors, found that despite fatigue and emotional exhaustion, subjects perceived the pandemic as an experience of learning non-technical skills, such as leadership and teamwork. Coughlan *et al.*¹ also detailed how intensive care units constituted a rich environment of learning and teamwork for doctors with different levels of experience. For example, an intern is a medical student who has completed their theoretical training but continues their practical training in a hospital under the supervision of experienced doctors.

Farahat *et al.*¹⁹ described the cognitive deterioration suffered by health personnel during the pandemic. The most affected processes were concentration, memory, and processing speed, associated with the presence of fear, depression, and anxiety. The excessive workload affected cognition and emotions. This study also speaks to the increase in cognitive load due to the risk of contagion.²⁰

Multiple studies demonstrate the relationship between emotional exhaustion and work performance. Ruiz²¹ documented the emotional impacts on doctors and nurses. The author noted the presence of Burnout due to intense exposure to human suffering and exhausting workloads. Burnout syndrome is related to chronic stress and the overwhelm caused by excessive work and occupational load. It generally affects professions that involve close care of other people.²²

The Intersection of Cognition, Emotions, and Culture

Human beings operate in a cognitive-emotional world. Our emotions affect our interpretation of the world and how we learn. At the same time, knowledge and cognition allow us to overcome adversities and find practical solutions.⁸ It is possible to restructure our emotions and cognition when we change our way of interpreting adverse situations. For example, instead of interpreting them as entirely negative, we have the ability to learn from difficult experiences in a beneficial way.

Now then, "emotional and cognitive processes are immersed in cultural systems",²³ people interpret our experiences based on the social context. Our interpretation of the world does not depend solely on internal processes in the brain.

Cognition extends beyond the individual, generating knowledge networks among people, even expanding to technology and other cultural artifacts.²⁴ From this perspective, cognition can be defined as an emerging process resulting from the interaction of individuals' internal resources, the social world, and technology (p. 4).²⁴ Technology helps solve problems and is crucial for science.²⁶ Medical knowledge is produced and socialized through the technology of information. When knowledge emerges, it is socialized primarily in written form, in digital journals, but also through direct social interaction.²⁷

The socialization of scientific knowledge during the pandemic depended on technology, the internet, social networks, electronic journals, cell phones, and computers. However, knowledge was also disseminated through face-to-face interaction among co-workers.

In the past, emotions were believed to be an automatic response to signals perceived in the physical and social environment. It was thought that everyone experienced emotions in the same way; however, neuroscientist Lisa Feldman demonstrated that people do not experience emotions equally; some identify them better than

others. This is known as emotional granularity.⁸ Emotions do not only involve neural processes; these are also combined with subjective processes.⁷⁻⁹

Methodology

We employed a qualitative methodology based on conducting semi-structured interviews with 12 doctors (six women and six men), two of whom are also part of the research team. The interviewees work in various areas of the Central University Hospital in the City of Chihuahua, which served as a COVID hospital during the pandemic (April 2020-2022). The interviews were recorded using an iPhone SE/MMX93E, transcribed using Word Office 2019, and organized by questions and themes using an Excel 2019 database. The information was analyzed qualitatively in light of theories on social and cultural learning,^{28,4,5} along with the perspective of socio-somatic theories of emotions.^{11,7-9}

The interviews were conducted from January 19 to November 12, 2021, at the facilities of the Faculty of Medicine at the Autonomous University of Chihuahua, while the pandemic was still ongoing. The medical researchers gave two tours to the anthropologists within the hospital, but they did not visit the COVID area. However, they had access to images of the physical area, though never of the patients. The medical researchers provided information on hospital protocols. Following ethical guidelines, we refer to people using pseudonyms.

Results

Regarding cognitive aspects, we found an acceleration of learning through both face-to-face interaction and social media. Within social learning processes,^{4,5} teamwork was highlighted. Some doctors were better able to meet the professional challenges posed by the pandemic due to their emotional intelligence. The constant study of scientific articles represented an individual learning strategy, but also became collective when discussed to evaluate their application within the hospital.

[...] *We obtain the information precisely from digital platforms, from scientific journals. We have evaluation criteria [...] based on the impact factor, indexing, the capacity or prestige of the authors, [...] and the external validity of the information, meaning whether it was really something executable in our environment.* (Interview with Dr. Eduardo Liceaga, August 14, 2021).

Another identified mode of learning relates to the oldest form of social learning: conversation. The exchange of experiences and feedback through oral communication was crucial for problem-solving. At the same time, direct observation and imitation led to the socialization of experiences, fostering collaboration. As Tomasello says, when individuals work together in a collaborative structure where power hierarchies are diluted, we can talk about collaborative learning, meaning we learn together in a coordinated manner to achieve a goal.⁵

From the first day I entered the area, I knew I had to study, that being a doctor does not mean you know everything. Obviously, sharing and talking with internists and intensive care doctors, who are specialists. Practically being on the same level of ignorance about the virus was impactful. Taking it day by day and trying to complement each other encouraged us to stay updated. (Interview with Dr. José María Vértiz y Delgado).

The doctors reported that the work was mainly done in teams, led by a COVID committee composed of doctors with the most clinical experience. The hospital's hierarchical structure became more horizontal, with everyone contributing ideas, proposals, knowledge, and personal patient care experiences. Although protocols were created, collaboration was fundamental, allowing the hospital to care for a high number of patients.

We formed the COVID committee, we started it, we organized it, we moved forward with plans and projects, whether feasible or not [...] until we reached an agreement and gave the pertinent instructions [...] and things were done collectively; there was never a decision solely from the director. All decisions were evaluated, supported and enriched by the team's ideas. (Interview with Dr. Emil Behring, September 27, 2021).

The testimony highlights the importance of collaborative work, breaking the vertical structure of the hospital and leading to consensus in decision-making. Collaboration enables an effective response as cognition extends beyond the individual. According to Bartra,²³ culture, society, and technology act as an "exobrain" that interacts with neural cognitive processes. We observe how socialization causes the circulation of knowledge.

Cognitive resources related to acquiring new knowledge, recalling learned information, and putting it into practice were not limited to studying and reading. It also required a social strategy supported by colleagues' experiences inside and outside the hospital. This extended the knowledge network locally and between hospitals. The guidance and teaching of more experienced doctors to newly hired ones were fundamental. Younger doctors, though knowledgeable from their university education, needed support from more experienced doctors.

I worked with him for one or two weeks, understanding the inner workings of the hospital [...] Later, I was more prepared to attend the front line [...] And from there, the specialists guided us [...] I started taking notes on articles, which were on topics I had learned theoretically in school, and from interactions with friends not in this hospital, such as friends from the military or ISSSTE who also treated COVID patients, and those doing PCR or antigen tests. (Interview with Dr. Matilda Montoya Lafragua, February 10, 2021).

We can observe the importance of the flow of information through friendships, and guidance from more experienced people. Theoretical knowledge was not enough; interactions between knowledgeable individuals and learners were necessary. Lave talks about a community of practice, a group of individuals intertwined in a cognitive network of shared knowledge, where the more experienced help new members learn new knowledge and practices.²⁹

Emotional Aspects

Faced with the challenge of learning and making quick decisions, physical demands, the risk of infection, and social isolation, doctors had to self-regulate their emotions, especially fear and

sadness. They also experienced anxiety and depression. Positive emotions, such as maintaining calm, good spirits, and motivation, played an important role in performing work under extreme conditions. A crucial factor that tested the emotional resilience of doctors was the use of PPE (Personal Protective Equipment). During the early phases of the pandemic, three pairs of gloves, double masks, face shields, goggles, overalls, and gowns were used. Therefore, the PPE caused anxiety, discomfort, and difficulties in seeing, hearing, and concentrating.

Yes, the first few times, yikes! It's quite uncomfortable, it makes you anxious. You feel like you can't endure the six hours because if you must go out, you'll have to remove everything [...] The equipment is very hot, so you get a sense of dehydration, headache [...] we're with a critical patient, we can't handle them, we can't hear each other with the respirators. Sometimes the equipment isn't the best; the goggles are scratched, and we can't see well [...] Emotionally, there's anxiety that you can't leave, and you must stay calm for six hours. (Interview with Dr. Marie Curie, February 25, 2021).

The testimony shows that emotional control was crucial, because people don't make decisions or solve problems using only reasoning; emotions constantly interact with rationality, keeping individuals alert and evaluating possible solutions. As Damasio points out, "emotions also help in the process of keeping in mind many factors that must be considered to reach a decision (p. 16).⁷

Some doctors mentioned that in their clinical practice, that they try to “maintain emotional distance”, and “avoid getting too involved to act objectively.”²⁷ This approach can be interpreted as functional dehumanization in the doctor-patient relationship, representing a strategy aimed at greater efficiency at the cost of dehumanized care.³⁰ However, during the pandemic, it was difficult to "maintain distance." The crisis was so intense that it constantly overwhelmed doctors' emotional control.

In the hospital, quick and decisive decisions had to be made for patients' lives, while the staff had to avoid getting infected. Although there were no cases of doctors dying in the hospital, there were

infections. News of doctors dying in other hospitals added to their concern, and doctors experienced fear and worry. Doctors were aware of the risks of their work, as seen in the following fragment:

Knowing that life is hanging by a thread is a direct confrontation with early death, especially with everything that was being reported in the news. The deaths kept coming, and the only thing on my mind was to survive this. (Interview with Dr. Françoise Barré, November 12, 2021).

However, the ability to self-motivate, optimism, empathy, pro-social behaviors, self-control, and persistence—emotional intelligence, in other words—represented the driving force on the front lines of defense.^{11, 31, 12} Caring for patients involved administering treatments using various invasive and non-invasive devices, monitoring their progress, and other procedures. At the same time, they needed to stay updated on the knowledge being published in scientific journals, adapt it to the local context, and implement it. Therefore, caring for COVID patients required doctors to learn to adapt both emotionally and cognitively.

Emotional intelligence and social learning emerged from the need to solve problems. Knowledge ceased to be purely scientific, transforming into a process of personal understanding situated within the social context of the pandemic. Since patients could not have contact with anyone, they died without saying goodbye to their families; they were only accompanied by doctors and nurses. They facilitated communication between patients and their families through letters, calls, and video calls. This empathetic and supportive behavior of the staff provided a positive emotional relief.

Sometimes I saw them outside, very desperate, saying, 'They don't tell me anything; they don't tell me how my dad is,' and I would say, 'Give me your number and I'll make a video call with him inside,' because, well, if I can't do anything else and there's no treatment, and it's not going to end soon, we need to make the wait easier. (Interview with Dr. Elizabeth Blackwell on February 10, 2021).

There were so many sick patients that there were particularly difficult moments for the doctors, who

sometimes did not know how to handle the situation. Some sought psychological help, and in some cases, medication, to re-establish and restructure themselves emotionally:

One day, a doctor came to me and said, 'Doctor, I need help. Yesterday, a patient died, we didn't have any more ventilators, and all I could do was hold her hand. I feel terrible [...] I'm overwhelmed.' So at that moment, of course, I sent him to psychology, we monitored him, and he was given a few days off. (Interview with Dr. Francoise Barré on November 12, 2021).

Discussion

It can be submitted for discussion; how anthropological sciences can contribute novel elements to learning and problem-solving in critical moments. The social and subjective reconfigurations experienced during the pandemic have been evident in the information obtained throughout our study. Social and human sciences should be able to explain how to develop non-technical skills, that is, emotional, cognitive, and social skills in health personnel and in the general population. One of the keys lies in the ability to work collaboratively and learn socially. Similarly, in the learning methods that emerged in hospitals, we saw that medical professionals formed work teams to improve their response efficiency, which is consistent with what Coughlan *et al.*¹ indicated.

Another aspect to discuss is the collaboration between medical professionals of different hierarchical levels, from students to specialists and directors. One might ask whether there truly existed a horizontal interaction within hospitals, or whether the need for quick actions momentarily caused a readjustment in social dynamics.

Like Warren *et al.*,¹⁸ a constant among doctors was recognizing the pandemic as an opportunity to learn non-technical skills and improve their pro-social abilities, which are seldom considered in their professional training. However, despite the learning experience, according to our study, stress, fear, uncertainty, anxiety, and depression affected the cognitive performance of doctors, particularly their concentration. This finding is like what Farahat *et al.*¹⁹ indicated.

In our research, we saw, like Díaz *et al.*,²⁰ that the use of PPE increased the cognitive load, triggering negative emotional processes, such as desperation. However, those same conditions fostered learning greater calm and patience. We also described, as Ruíz²¹ did, that the high exposure of doctors to the suffering of their own family members, themselves, and their colleagues, coupled with constant worry and excessive workload, resulted in emotional and physical exhaustion.

From an anthropological perspective, this can be interpreted as evidence of the relationship between cultural context, cognition, and emotions. We can analyze this link as a self-sustaining autopoietic feedback system, meaning a system that maintains itself through the interaction of its subsystems, emerging as a completely new state, but also as a product of that interaction.³²

This perspective contributes to the discussion of cognitive anthropology, which has traditionally situated culture as a disembodied phenomenon, disconnected from emotions. Contrary to this view, Hutchins²⁴ proposed thinking of culture as an emergent process resulting from distributed cognition, which means going beyond the individual and incorporating teamwork for problem-solving and knowledge generation, including technology, the environment, and biological agents in this cognitive distribution.

Simultaneously, Lave²⁹ illuminates the discussion with her proposal on situated cognition, suggesting that knowledge and learning are situated in specific places, social contexts, and historical moments. Understanding behavior and practices from the anthropological framework requires considering these aspects and not disconnecting human cognition from the social context. In line with Feldman,⁸ emotions affect thoughts and learning, but at the same time, emotions help us overcome adversity.

However, controlling emotions is not enough. Scientific knowledge was fundamental, providing a cognitive basis for positive emotions, representing the great strength of medical practice during the pandemic. It is worth questioning whether only positive emotions contributed, and what the exact role of negative emotions was in

this process. The combination of emotional intelligence and collaborative learning observed in the hospital contradicts purist views on science, where scientific practice is conceived as a phenomenon separate from emotions and everyday social interaction.⁵

Conclusions

The emotional and cognitive experience that the pandemic represented for doctors has been made evident. The main concerns and challenges faced by them have been highlighted. The inseparable relationship between emotions and cognition, a binomial that enables adaptive responses to problem-solving in critical moments, has been made visible. Throughout the article, the interaction of a network of scientific and emotional knowledge has been exposed. These seemingly separate intelligences were shown by the pandemic to be co-constitutive and necessarily essential for survival.

We observed that positive emotions and feelings appeared to be the key to the success of medical professionals; to perceive adversity as a driving force for learning. The satisfaction felt in recognizing the capacity for empathy and solidarity shown with patients, their families, and colleagues was a certainty amid the uncertainty. The value of collaboration and social learning was demonstrated, as well as the importance of social relationships, friendships, and colleagues. The preeminence of studying and reading the scientific knowledge generated worldwide, the pivotal role of technology, the internet, and mobile phones for the socialization of information were all highlighted.

We saw that cognitive processes related to learning were not solely composed of scientific knowledge; it also involved feeling emotionally capable and revaluing the human side of knowledge. It was observed that stress, fear, or uncertainty seemingly hinder adequate learning, suggesting a need for a kind of emotional-cognitive homeostasis. It is necessary to understand that the body and mind represent a global system rather than separate domains.

One of the weaknesses of the research was the lack of analysis by gender and the variable related

to different positions and roles that medical professionals had within the hospital structure. Future research on these aspects is necessary.

Finally, we must acknowledge the need for future collaborations between social scientists and medical professionals. It is imperative to conduct transdisciplinary studies to face future pandemics. We must relearn ways to organize medical care, causing the least possible impact on the physical and emotional health of healthcare personnel.

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