

## INFORMATIONAL PANDEMIC

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*Accepted July 22, 2020*

This article shows that in addition to the viral pandemic, caused by the SARS-CoV-2 coronavirus, which conquered the entire earth, there was also an informational pandemic, caused by excessive media coverage of the virotic pandemic. Although this media coverage was absolutely necessary to make known the possibilities of prevention and treatment, but it exceeded these needs and bombarded the population with a lot of uncertain, confusing and even contradictory information. And we have repeatedly shown that although it is absolutely necessary, the information can also produce a whole series of mental disorders, such as information stress, anxiety, depression and phobia. Which can be accompanied by a number of somatic manifestations, such as palpitations, tachycardia, muscle aches, headache, abdominal pain, nausea and sweating. As well as a number of endocrine and metabolic changes, such as increased catecholamines and cholesterol. The article shows how isolation at home or in the hospital has deprived patients of the necessary information on distant relatives or colleagues at work. But at the same time it produced a veritable bombardment with a whole series of negative information, regarding the evolution of the epidemic, which determined the increase of fear, confusion, insomnia, anxiety and depression among the population.

*Keywords:* viral pandemic, informational pandemic, isolation troubles, negative information bombardment, informational stress.

While the new coronavirus, called SARS-CoV-2, which is highly contagious and highly aggressive, was conquering the whole earth, in addition to the viral pandemic, there was an information pandemic, because the pandemic caused by the new coronavirus was the most publicized event of all time. Thus, informational pandemic appeared very quickly much more extensive and much more contagious than the virotic pandemic<sup>1</sup>. It is obvious that this media coverage was absolutely necessary to convey to the population the possibilities of prevention and diagnosis of the disease. But the information transmitted by the media has been so numerous and so negative that it has exceeded our capacity to receive and process information. That is why they had in addition to the positive effects and a whole series of negative effects. And these negative effects were not limited to the nervous system, but also extended to the immune system, which plays a key role in the evolution of the pandemic<sup>2</sup>. That is why many authors have noted the fear, panic, anxiety, neurosis and even psychosis, which the avalanche of negative information has produced among the population<sup>3</sup>.

So we can speak not only of a viral pandemic, but also of an informational pandemic, which is much more extensive and subtle than the virotic pandemic<sup>4</sup>.

The importance of information for maintaining our health. After a long time, people's attention was limited only to the substance and energy of which we are composed, when scientists wondered how the body manages to maintain its homeostasis, i.e. health, in a highly variable environment and often even very hostile, it was concluded that in order to achieve this our body also needs information. That is why Norbert Wiener, the founder of cybernetics, said that man cannot live without adequate information<sup>5</sup>. But at the same time, he also pointed out that information cannot be confused with substance or energy, which generates and transports it. Because being the most communicable part of reality, information can pass very easily from one signal to another. Which makes it possible for different signals to transmit the same information and vice versa. And we have shown that information is another aspect of reality, which has other laws of conservation and transformation and is measured in other units of measurement<sup>6</sup>.

Information is the measure of order and organization, or rather of the novelty that disorder or reorganization can bring. We are all made up of the same substances and the same energy, which are arranged differently in each of us. And this is determined by the genetic information we received from our parents. That is why we differ more in terms of information than in terms of the substances and energy of which we are composed.

Then to differentiate the substance that is measured according to its weight or volume, and energy is measured the force that intervenes in the development of phenomena, the information is measured in bits, the bit representing the novelty that can bring an event with only two possible results and equiprobable. Such as yes or no, closed or open, girl or boy, etc. That is why information technology is based on binary logic.

Then, because we need a lot of information, our body has a lot of internal and external receptors with which it manages to receive information generated by environmental variations. But this information must reach all the cells involved in the regulatory processes that seek to maintain homeostasis, ie the health of the body. That is why our body has become an extremely complicated communication system<sup>7</sup>. And all the cells and all the molecules of the organism participate in the construction and functioning of this system. For example, neurons, leukocytes and lymphocytes contribute to building the system. And synaptic messengers, hormones and cytokines, contribute to the transmission of information through this system. Obviously, the body's communication system is an extremely complex system. But we pointed out that no matter how complicated it is, the communication system of our body has two main highway. It has a longitudinal highway, along which genetic information is transmitted vertically, from one generation of cells to another generation of cells. And a transversal highway, along which the information received from the external environment is transmitted, from one cell to another, within the same generation of cells.

Much of the information received reaches the brain, which regulates external behavior. And another part of the information received reaches the level of internal organs that seek to maintain the homeostasis of the body, despite the information generated by those variations. But much of the information received reaches, through epigenetic mechanisms, the genome that synthesizes the proteins, hormones, enzymes and antibodies, that our body needs to eliminate, for example, the coronavirus that produced this pandemic<sup>8</sup>.

It should be noted that many forms of information circulate through our body, such as genetic information, received from parents, molecular information, carried by various chemical messengers and nerve information, which is transmitted along the body's nerve network. But our brains have several informational stages, such as the signal stage represented by wave trains and synaptic messengers. Above the signal floor is the information floor, which our brain manages to discover in received signals. And above the information floor there is a semantic floor, regarding the significance of the information discovered, for the fulfillment of the genetic program, which we inherited from our parents<sup>9</sup>.

All this information is intended to ensure the effectiveness of the regulatory mechanisms on which our health ultimately depends. It should be noted that in the communications system it works with an informational causality. Because the information does not determine, but only triggers a certain action. That is, the information acts on a receptors that will trigger the entry into operation of some regulation mechanisms. And they will use their own substances and energy to fulfill their own genetic program, despite the many variations that take place in the environment. That is why we could say that information is as necessary as breathing and food, without which the human body cannot live. If without air, the body can only live a few minutes. Without water he can only live a few days. And without food he can live only a few decades. Without information he can only live for a few seconds. That is why the brain, which is an informational organ, is the one that dies first<sup>10</sup>.

Information as a pathogenic factor. But although it is absolutely necessary for the regulation of external behavior and internal functions, information can also become, in certain situations, a pathogenic factor<sup>11</sup>. And this is due, on the one hand, to the fact that our body needs certain information, and on the other hand to the fact that our body has a very limited capacity to receive and process the information it needs. In this sense, it was found that of the 1011 bits that the environment generates every second, our body manages to receive with the help of the sense organs, only 107 bits per second. And due to the limited capacity of the afferent nerves, our body can transmit to the brain only 106 bits per second. But of the 106 bits per second that the brain receives, only 10–15 bits per second manage to reach the level of our consciousness. That is why our body will not be able to support either the lack of the necessary information or the excess of information<sup>12</sup>.

In this respect, research has shown that in the absence of the necessary information, a whole range of very serious disorders can occur, such as disorientation, confusion and even delirium and hallucinations<sup>13</sup>. And we have shown, since 1970, that excess of information can lead to an information aggression syndrome, manifested by mental and somatic symptoms such as fatigue, irritability, anxiety, mental depression and insomnia. As well as a number of somatic manifestations, such as palpitations, tachycardia, muscle pain, headache, abdominal pain, nausea, sweating and more<sup>14</sup>. At the same time, we pointed out that in addition to clinical manifestations, information request can also produce a number of endocrine and metabolic changes, such as increased catecholamine synthesis<sup>15</sup> and cholesterol levels<sup>16</sup>.

But not only the quantity but also the quality of the information received can cause certain disorders. For example, we have shown that psychotrauma often encountered in mental disorders, such as post-traumatic stress, is determined precisely by the quality of the information received<sup>17</sup>. Finally, some clinical manifestations may be caused by the disturbance of the transmission and processing of information through the communication system of the human body. As is actually the case in most mental illnesses which ultimately have an informational etiopathogenesis<sup>18</sup>.

And the isolation of all people at home or in hospitals, as well as the excessive media coverage of the pandemic has led to the emergence of information disorders in many people. The isolation of all healthy people has led to their deprivation of life information, provided by friends, distant relatives and colleagues at work. On the other hand, during the pandemic, people were constantly bombarded with a series of negative information. But the pandemic also influenced the transmission and processing of information by the human body, through the direct action of the virus on the body. This is what happened to some patients with COVID-19, who were left with post-traumatic stress.

Informational overload of contemporary man. But we also lived before the appearance of the pandemic in an information society, characterized by the extremely fast growth of information production, as well as the mass media. That is why we have long been assailed by a very large amount of information, through the press, radio, television, mobile phone, internet and Facebook, so that contemporary man was kept in and before the

pandemic, of a permanent informational stress<sup>19</sup>. It has been found that contemporary man devotes more than 9 hours a day to modern media. Because he became, paradoxically, not only assaulted, but also addicted to this information. We have shown that information intake increases the synthesis of endorphins and dopamine<sup>20</sup>. That is why many people become addicted to television and over 70% of young people are addicted to mobile phones<sup>21</sup>. Which makes the contemporary man live more in a virtual world, in a world of news and soap operas, than in the real world, which can have serious repercussions on his health<sup>22</sup>.

But not only the quantity but also the quality of the information can cause certain disorders. Because our body needs certain information and because there is not much neutral information that is not invested with a certain emotional color. We have shown that psychotrauma acts precisely through the quality of the information it brings, i.e. through the meaning it has for us that information<sup>17</sup>. And the negative information transmitted by the media, especially in this pandemic, has a very high emotional load and significance, because it calls into question not only human health but also human life<sup>23</sup>. I. Goldin<sup>24</sup> points out that this pandemic is the greatest disaster that developed countries have ever experienced. And receiving such negative information, often exaggerated, can lead to the automatic and unconscious installation of anxiety, depression and phobias. Because as A. Newberg and M.R. Waldman<sup>25</sup>, negative information stimulates the activity of the amygdala which determines their degree of anxiety. But they inhibit the activity of the frontal lobe which should moderate that anxiety. And anxiety can eventually lead to somatic disorders, such as high blood pressure, for example<sup>26</sup>. Because not only physical, chemical and biological factors, such as coronavirus, but also information requests can have many somatic repercussions<sup>27</sup>. It is known, for example, that mental stress can have a very large influence on the immune system<sup>28</sup>. But the immune system can also have a very large influence on the nervous system<sup>29</sup>. Because the recognition of the virus and the synthesis of antibodies by the immune system is based on the informational aspect of the phenomena, which is influenced by information generated by the nervous system, which can influence the migration of lymphocytes, for example<sup>30</sup>. All this shows that the negative information with which we are assaulted can influence not only mental health, but also the

functioning of the immune system and the evolution of the pandemic.

*Information disorders caused by the COVID-19 pandemic.* Due to very severe isolation measures, such as hospitalization all sick people, or isolation of healthy people at home, the closure of schools, theaters, restaurants, churches, the use of masks and social distance, have deeply disturbed people's minds. First of all, they were deprived of the absolutely necessary information generated by their living and working environment. For example, they could no longer see their friends, parents, or children in another locality. On the other hand, they did not know the situation at their place of work. Which produced a whole series of very important mental disorders. Second, they began to be bombarded by the media with a lot of negative, emotionally charged information about the evolution of the pandemic, such as the increase in the number of cases, the increase in the number of deaths, or the lack of apartheid and beds in intensive care units, information that also produced, certain mental disorders.

As is well known, information deprivation, such as isolation at home, can lead to a whole range of mental disorders, such as anxiety, confusion, disturbance of biological rhythms, to delirium and hallucinations<sup>13</sup>. That is, if man does not receive the necessary information, he begins, at some point, to invent and conspire. This is why many researchers have shown that although isolation can be very useful in preventing and combating communicable diseases, it can lead to a whole range of mental disorders, such as fatigue, anxiety, depression, insomnia, obsessive-phobic disorders, such as excessive washing, phobia of crowded places and so on<sup>31</sup>.

On the other hand, psychoimmunological research has shown that isolated people are more prone to infectious diseases. It has been found that the immune system of isolated people responds much less poorly to infections. And K.J. Smith, S. Gavey and N.E. Riddell<sup>32</sup> showed that loneliness and isolation intensify inflammatory processes, which play a very important role in coronavirus pneumonia, which is actually hyperinflammation. Research has also shown that isolation has led to a 40% increase in alcohol and tobacco use and 26% in pornography. Not to mention the increase in aggression in the family, the increase in divorces, lack of exercise and obesity, which are a risk factor very common in coronavirus infection<sup>33</sup>.

Therefore, to prevent and combat the negative effects of isolation, the WHO recommends the

adoption of new routines on exercise, cleaning, reading, painting, meditation, telephone and e-mail communication with relatives and friends, so as not to feel completely isolated in this world, often very problematic.

But in addition to being deprived of absolutely necessary information about their living environment, the status of relatives and friends, as well as information at their place of work, about the economic situation of that company, people in isolation were bombarded with a lot of negative information about the evolution of the pandemic and even deaths. And this negative information, which is processed with priority, cannot but influence our state of health. All this negative information has produced a very strong informational stress on people. And this information stress not only reduced the body's immune defense capacity, but as psychoimmunological research has shown, has also led to the inevitable death of some neurons<sup>34</sup>.

That is, the deprivation of certain positive information and overloading with some negative information produced a whole series of mental and somatic disorders on people during the pandemic. That is why Chinese researchers have shown that during the pandemic, depression among the general population increased by 50%, anxiety by 45% and insomnia by 34%. And Italian researchers found that 20% of patients were left with obsessive-phobic tubing, 40% with insomnia, and 28% with post-traumatic stress<sup>35</sup>.

## DISCUSSIONS

The current pandemic has profoundly changed our lives, because unlike the old epidemics, the current pandemic has come into an information society in which we were already prisoners of information and the media. And this has influenced not only our health, but also the evolution of the pandemic. Because in the avalanche of information the people they were associated with, they could no longer distinguish between true news and false news. That is why the WHO has drawn attention to infodemia, ie false information, which accompanies the pandemic created by the coronavirus.

In today's information society, in which the mass media have great power, we have reached the situation where it is not the event that creates the information, but the information that creates the event. That is why people's health can be easily affected by the negative information conveyed by media channels. The contradiction between true news and false news can cause internal tension,

anxiety, fear, anxiety, panic and frustration. For if anxiety is a fear without an object, fear has a precise object. And the negative information has come to cause great fear among the population. They came to determine a fear of illness, a fear of death, a fear of hospital, a fear of unemployment, a fear of poverty.

But fortunately, in addition to the limited possibilities of receiving and processing information, our body also has a whole range of defense mechanisms, such as thresholds, filtering, inhibition, attention, fatigue, sleep, repression and finally even denial of negative information. That is, in order not to get sick, he can filter that information. He may not give them the attention they deserve. And at some point he may deny them<sup>36</sup>. That is why people no longer obey the orders given by the authorities. That is why there have been a number of social reactions against the isolation measures imposed by the authorities. In any case, the pandemic caused by the virus is accompanied by an informational pandemic that causes many mental and somatic disorders among the population. And the informational pandemic lasted long after the virotic pandemic left.

## REFERENCES

- Restian, A., Informația este mai contagioasă decât coronavirusul, *Medica Academica*, 5, 2020, 18-22.
- Irwin, M., Vedhara, K., *Human Psychoneuroimmunology*, Oxford University Press, 2005.
- Brunier, A., Harris, M., Substantial investment needed to avert mental health crisis, *WHO Newsletter*, 2020.
- Restian, A., De la viroză la nevroză, *Viața Medicală*, nr. 20, 2020.
- Wiener, N., *Cybernetica*, Herman, Paris, 1948.
- Restian, A., Principiile de conservare și de transformare ale informației, *Studii și Cercetări de Biotehnologie*, 1980.
- Restian, A., Organsimul uman ca sistem de comunicații, *Practica Medicală*, 3, 2017, 129-138.
- Restian, A., Epigenetica, interfața dintre genom și mediu, *Practica Medicală*, 4, 2010, 237-245.
- Restian, A., Tranzition of nervous activity from signal to information processing, *International Journal of Neuroscience*, 4, 1979, 21-30.
- Restian, A., Sănătatea ca rezultat al unor procese de reglare, *Practica Medicală*, 4, 2017, 177-187.
- Restian, A., Informația ca factor patogen, *Practica Medicală* 2, 2018, 87-96.
- Restian, A., *Medicina cibernetică*, Editura Dacia, Cluj Napoca, 1984.
- Burgmeister, J., Privation sensorielle, *Confrontations Psychiatriques*, 6, 1970, 279-297.
- Restian, A., Le syndrome d'agression informationnels, *Agressologie*, 2, 1970, 85-93.
- Restian, A., Daghie, V., Influența solicitărilor informaționale asupra secreției de catecolamine, *Congresul național de Fiziologie*, 1986.
- Restian, A., Moldovan, V., Influența solicitărilor informaționale asupra colesterolemiei, *Revista Medico-Chirurgicală*, Iași, 2, 1978, 87-94.
- Restian, A., Valoarea informațională a psihotraumei, *Revista Medico-Chirurgicală*, 3, 1970, 625-630.
- Restian, A., *Encephale*, 2, 1970, 101-133.
- Restian, A., Patologia specifică societății informaționale, *Congresul Asociației Medicale Române*, 2019.
- Cristea, A., Restian, A., Endogenous opioid abstinence syndrome, *Rom. J. Physiology*, 3, 1993.
- Singh, B. M., Cell Phone Dependence – a new diagnostic entity. *Delhi Psychiatry Journal*, 11, 2008, 123-124.
- Faasse, K., Gamble, G., Cundy, T., Impact of television coverage on the number and type of symptoms reported during a health scare: A retrospective pre-post observational study. *BMJ Open* 4, 2012, 1–7.
- Holman, E. A., Garfin, D. R., Lubens, P., Media exposure to collective trauma, mental health, and functioning: Does it matter what you see? *Clinical Psychological Science*, 8, 2020, 111–124.
- Goldin, I., Coronavirus is the biggest disaster for developing nations in our lifetime, *The Guardian*, 21 April, 2020.
- Newberg, A., Waldman, M.R., Cuvintele îți modelează creierul, *Curtea Veche*, 2019.
- Gerin, W., Rumination as a mediator of chronic stress effects on hypertension: A causal model. *Int J Hypertens* 2012, 453–465.
- Restian, A., Cristea, A., Manifestările somatice ale solicitărilor informaționale, *Revista Medicală Română*, 1, 1993.
- Padgett, D.A., Glaser, R., How stress influences the immune response, *Trend in Immunology*, 8, 2003, 444-448.
- Rabin, B.S., Cohen, S., Ganguli, R., Bidirectional interaction between the central nervous system and the immune system, *Critical Reviews in Immunology*, 4, 1989, 279-285.
- Clifford A., Ottaway, A., Husband, J., Central nervous system influences on lymphocyte migration, *Brain, Behavior, and Immunity*, 2, 1992, 97-116.
- Brooks, S.K., The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, February 26, 2020.
- Smith, K.J., Gavey, S., Riddell, N.E., The association between loneliness, social isolation and inflammation: A systematic review and meta-analysis, *Neuroscience & Biobehavioral Reviews*, 112, 2020, 519-541.
- Kass, D.A., DugL, P., Cingolani, O., Obesity could shift severe COVID 19 disease to younger ages, *Lancet*, 395, 2020.
- Fan, W., Wang, Q., Yan, Y., Influence of *Xingnao Jieyu* capsule on hippocampal and frontal lobe neuronal growth in a rat model of post-stroke depression, *Neural Regen Res*, 7, 2012, 187–190.
- Mazza, M.G., Lorenzo, R., Conte, C., Anxiety and depression in COVID-19 survivors: role of inflammatory and clinical predictors, *Brain, Behavior, and Immunity*, 30 July 2020.
- Restian, A., Patologia informațională, Editura Academiei Române, 1997.