

Mini-review

# The importance of psychological messages and the “question-behavior effect” about remdesivir

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**Edited by:**

Marcelo Moraes Valença

**Keywords:**

2019 coronavirus disease (CO-  
VID-19)  
Remdesivir  
Psychiatry

## Abstract

### Background

The FDA has been requiring that information about using remdesivir to treat COVID-19 be made available to healthcare providers and patients, including dosing instructions, potential side effects, and drug interactions. It is important to observe the initial indicators of anxiety, fear, and euphoria for families during emergencies, including information on the possible side effects. This situational context is very important in all the world, because it opens doors for providing the use of updated information about treatment follow-up and for offering improved mental health services.

### Method

The studies were identified in well-known international journals found in two electronic databases: Scopus and Embase. The data were cross-checked with information from the main international newspapers.

### Results

The high expectations supported by an immediate discourse culminate in frustration and displeasure, while more consistent empirical results are not generated. These two are predictors of psychic suffering, especially due to the scarcity of information and uncertainties. In parallel, recent studies indicate that spreading information without scientific basis intensifies damage to the routine and health of people, which are already impacted by the pandemic situation. This misrepresented spread may be a factor for unleashing fear and, as a consequence, social despair.

### Conclusions

Based on the impulsive scenarios stimulated in the context of hydroxychloroquine and on the high spread of fake or distorted news, the psychiatric impacts of COVID-19 pandemic associated with the use of remdesivir may be worsened and reflected directly on the population's self-esteem.

Received: August 16, 2021  
Accepted:

Remdesivir has been suggested as an option for COVID-19 patients’ therapy treatment.<sup>1</sup> Remdesivir (development code GS-5734) is a broad-spectrum antiviral drug.<sup>2</sup> The Food and Drug Administration (FDA) issued an emergency approval for remdesivir as a treatment for patients severely ill with COVID-19, which is the disease caused by the coronavirus (The New York Times, 2020). The action of FDA specifies that the drug can be used for adults and children with a suspected or confirmed diagnosis of COVID-19, who are seriously ill with low blood oxygen levels or who may be on a ventilator.<sup>3</sup>

The FDA has been requiring that information about using remdesivir to treat COVID-19 be made available to healthcare providers and patients, including dosing instructions, potential side effects, and drug interactions.<sup>4</sup> It is important to observe the initial indicators of anxiety, fear, and euphoria for families during emergencies, including information on the possible side effects. This situational context is very important in all the world, because it opens doors for providing the use of updated information about treatment follow-up and for offering improved mental health services in the process of dealing with the remdesivir intervention, intensifying several forms of psychosocial intervention services for the families, in dealing better with urgent psychological problems of people involved in the COVID-19 epidemic. Fear surely seems to be a consequence of this new treatment.<sup>5,6</sup>

More current studies highlight insufficient power to detect presumed differences in clinical results, due to a very late beginning of the treatment in COVID-19 and absence of data regarding the recovery of infectious virus or possible appearance of reduced susceptibility to remdesivir. In addition, there is not an answer if a longer treatment and a higher dosage of remdesivir would be beneficial in patients with severe COVID-19. Ongoing studies with larger samples will continue reporting our understanding on the effect of remdesivir in COVID-19. In addition, strategies to increase the remdesivir antiviral potency (for instance, regimes of higher dosage, combination with other antivirals or neutralizing antibodies of SARS-CoV-2) and to mitigate the immunopathological responses of the host that contribute to the severity of this disease (for instance, IL-6, IL-1 or TNF $\alpha$  inhibitors) require a careful study in patients with severe COVID-19.<sup>7</sup>

Thus, the high expectations supported by an immediate discourse culminate in frustration and displeasure, while more consistent empirical results are not generated. These two are predictors of psychic suffering, especially due to the scarcity of

information and uncertainties. In parallel, recent studies indicate that spreading information without scientific basis intensifies damage to the routine and health of people, which are already impacted by the pandemic situation.<sup>8</sup> This misrepresented spread may be a factor for unleashing fear and, as a consequence, social despair. Thus, based on the impulsive scenarios stimulated in the context of hydroxychloroquine and on the high spread of fake or distorted news, the psychiatric impacts of COVID-19 pandemic associated with the use of remdesivir may be worsened and reflected directly on the population’s self-esteem.<sup>5,6,9</sup>

It is noteworthy that self-esteem maintenance during pandemic times is the result of a constant process of resilience. Resilience refers to the class of phenomena characterized by positive adjustment standards in the context of adversities or significant risks for the development.<sup>9</sup> The construction of resilience, in turn, mainly aims to increase the sense of self-esteem present during crisis. This is especially coated by intentions to mitigate experiences of fear related to the crisis. However, the conception of hope present in the remdesivir treatment as a therapeutic offer contributes as a positive adjustment in the scenario of adversities. Therefore, strengthening the center sense of positivity will also contribute to the sense of optimism and hope, which is commonly found among resilient people that are capable of overcoming challenges.<sup>10-12</sup>

In all the world, psychology and behavioral analysis have been used rather as a late reflection than as a preventive or integrated strategy in the efforts of fighting against COVID-19. The importance of psychological messages and the “question-behavior effect” about remdesivir help define a path that devastates or enables awareness. The lack of proper information will result in higher incidence of suicide, impaired health infrastructure, increase of divorce rates, domestic violence, childhood abuse and worsened conditions of mental health. These are daily questions that mental health should face with deep comprehension and under intense repercussion about pain and psychic suffering of families. The remdesivir intervention should not be in the last place of the list of mental health priorities.<sup>8,11,12</sup>

### Highlights

The FDA has been requiring that information about using remdesivir to treat COVID-19 be made available to healthcare providers and patients, including dosing instructions, potential side effects, and drug interactions.

It is important to observe the initial indicators of anxiety,

fear, and euphoria for families during emergencies, including information on the possible side effects.

In all the world, psychology and behavioral analysis have been used rather as a late reflection than as a preventive or integrated strategy in the efforts of fighting against COVID-19.

The importance of psychological messages and the “question-behavior effect” about remdesivir help define a path that devastates or enables awareness.

The remdesivir intervention should not be in the last place of the list of mental health priorities.

### Conflict of interest

The authors declare that they have no competing interests.

### Acknowledgment

Brazilian National Council for Scientific and Technological Development (CNPq) – institution linked to the Brazilian Department of Science, Technology and Scientific Writing Lab, Medicine School – Universidade Federal of Cariri (UFCA).

### Funding

The Suicidology Research Group from Universidade Federal do Ceará (UFC) and Brazilian National Council for Scientific and Technological Development (CNPq) – institution linked to the Brazilian Department of Science, Technology and Innovation to encourage research in Brazil.

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## References

- Morse JS, Lalonde T, Xu S and Liu WR. **Learning from the Past: Possible Urgent Prevention and Treatment Options for Severe Acute Respiratory Infections Caused by 2019-nCoV.** *Chembiochem* 2020;21(5):730-738 Doi:10.1002/cbic.202000047
- Al-Tawfiq JA, Al-Homoud AH and Memish ZA. **Remdesivir as a possible therapeutic option for the COVID-19.** *Travel Med Infect Dis* 2020;34:101615 Doi:10.1016/j.tmaid.2020.101615
- Edwards E. **FDA grants remdesivir emergency use authorization for COVID-19** [Internet]. News; 2020 [cited 2021]. Available from: <https://www.nbcnews.com/health/health-news/fda-grants-remdesivir-emergency-use-authorization-covid-19-n1197576>.
- McGinley L and Rowland C. **FDA authorizes use of Gilead Sciences’ remdesivir for patients severely ill with covid-19** [Internet]. The Washington Post; 2020 [cited 2021]. Available from: <https://www.washingtonpost.com/health/2020/05/01/fda-authorizes-use-gilead-sciences-remdesivir-severely-ill-patients-with-covid-19/>.
- Lima CKT, Carvalho PMM, Lima I, Nunes J, Saraiva JS, de Souza RI, . . . Neto MLR. **The emotional impact of Coronavirus 2019-nCoV (new Coronavirus disease).** *Psychiatry Res* 2020;287:112915 Doi:10.1016/j.psychres.2020.112915
- Carvalho PMM, Moreira MM, de Oliveira MNA, Landim JMM and Neto MLR. **The psychiatric impact of the novel coronavirus outbreak.** *Psychiatry Res* 2020;286:112902 Doi:10.1016/j.psychres.2020.112902
- Wang Y, Zhang D, Du G, Du R, Zhao J, Jin Y, . . . Wang C. **Remdesivir in adults with severe COVID-19: a randomised, double-blind, placebo-controlled, multicentre trial.** *Lancet* 2020;395(10236):1569-1578 Doi:10.1016/s0140-6736(20)31022-9
- Júnior JH, Raasch M, Soares JC and Ribeiro LVHADs. **Da Desinformação ao Caos: uma análise das Fake News frente à pandemia do Coronavírus (COVID-19) no Brasil.** *Cad Prospecção* 2020;13(2):331-346 Doi:10.9771/cp.v13i2%20COVID-19.35978
- Zanon C, Dellazzana-Zanon LL, Wechsler SM, Fabretti RR and Rocha KN. **COVID-19: implicações e aplicações da Psicologia Positiva em tempos de pandemia.** *Estud psicol* 2020;37:e200072 Doi:10.1590/1982-0275202037e200072
- Casale S and Flett GL. **Interpersonally-based fears during the COVID-19 pandemic: reflections on the fear of missing out and the fear of not mattering constructs.** *Clinical Neuropsych* 2020;17(2):88-93 Doi:10.36131/CN20200211
- Bais AMS. **Why emotional epidemiology is key to a successful COVID-19 response** [Internet]. World Economic Forum; 2020 [cited 2021]. Available from: <https://www.weforum.org/agenda/2020/05/understanding-emotional-epidemiology-is-key-to-halting-the-spread-of-covid-19/>.
- Kolata G. **How Remdesivir, New Hope for Covid-19 Patients, Was Resurrected.** [Internet]. The New York Times; 2020 [cited 2021]. Available from: <https://www.nytimes.com/2020/05/01/health/coronavirus-remdesivir.html>.