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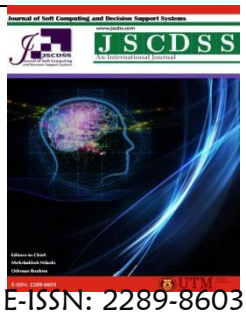

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# Does Explainability Enhance the Effectiveness of AI Models in Public Health? The COVID-19 Context

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**Abstract**

Generative AI models, such as ChatGPT, offer versatile applications in healthcare, particularly in the COVID-19 era. While these models show promise in medical decision support, the imperative of explainability cannot be overstated. Understanding how AI arrives at recommendations is crucial for transparency and trust, especially in critical areas like COVID-19 management. However, challenges persist in elucidating the decision-making processes of AI models, potentially hindering their acceptance in medical practice. This paper discusses the necessity of prioritizing explainability mechanisms tailored for AI-powered linguistic models, particularly in the context of COVID-19-related healthcare decisions. By shedding light on AI reasoning, explainability mechanisms not only enhance transparency and accountability but also foster trust among medical professionals, facilitating informed collaboration between human expertise and AI capabilities.

Keywords: Explainability, ChatGPT, COVID-19, XAI, Healthcare, Machine Learning

## 1. Introduction

In 2019, SARS-CoV-2, or COVID-19, first emerged in the city of Wuhan, China. Initially, it appeared as a localized occurrence of respiratory distress, attributed to a novel mutation of a previously unknown pathogen. COVID-19 has profoundly impacted people's lives worldwide (Abumalloh et al., 2021; Nilashi, Abumalloh, et al., 2021; Nilashi, Abumalloh, Alrizq, Alghamdi, et al., 2022; Nilashi, Abumalloh, Alrizq, Almulihi, et al., 2022; Nilashi, Abumalloh, Minaei-Bidgoli, Zogaan, et al., 2022; Nilashi, Abumalloh, Mohd, et al., 2023; Nilashi, Asadi, et al., 2021; Rupani et al., 2020; Taheri et al., 2021), causing widespread illness and mortality, and increased levels of stress and anxiety (Husky, Kovess-Masfety, & Swendsen, 2020). As of October 18, 2023, the World Health Organization (WHO) has recorded a total of 771,407,825 reported instances of COVID-19 worldwide, along with 6,972,152 reported fatalities (WHO, 2023). Billions of individuals have received COVID-19 vaccines globally, safeguarding them from the SARS-CoV-2 virus and preventing over 20 million fatalities (Callaway, 2023). However, certain viral variants have demonstrated the ability to partially elude the immunity conferred by the initial vaccines. Consequently, vaccine researchers worldwide are actively involved in the development of numerous 'next-generation' COVID-19 vaccines (Callaway, 2023). Like many other viruses, COVID-19 is susceptible to evolving over time, and this evolution can result from various factors, including environmental influences. While some of these changes are minor and do not substantially affect the virus's characteristics, others can have a significant impact, such as increasing its contagiousness. These alterations in the virus are referred to as mutations, and when one or more mutations occur, the virus is categorized as a variant. Whenever a new variant of the virus emerges, the WHO adopts a system of assigning it a letter from the Greek alphabet. In response to the emergence of new variants, the WHO and numerous