Letter to Editor

Harnessing Artificial Intelligence for Rare Psychiatric Disorders: A Call to Action

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Artificial intelligence has revolutionized the field of healthcare, including psychiatry. It has shown its potential in aiding psychiatric research, providing accurate diagnosis, and improving prognosis and treatment. AI has been used for several psychiatric disorders such as depression, schizophrenia, anxiety disorders, bipolar disorder, and autism spectrum disorders (ASD). Other than enhancing diagnostic precision and screening of high-risk individuals, machine learning approaches have been used to predict the efficacy of specific interventions, such as pharmacotherapy or psychotherapy, and monitoring patients' mood and symptoms through mobile apps. Moreover, Natural language processing technologies can aid traditional assessment methods by analyzing speech and text patterns. Thus, contributing to early diagnosis, prompt intervention, and personalization of treatment.[1] Although a lot of work has been done on common psychiatric disorders, the rare and uncommon mental health disorders are harder to study, which can lead to diagnostic and therapeutic challenges. Although simulation training has shown some benefit in this regard, it is not practiced everywhere. Several challenges are faced by patients having rare diseases, including delayed or incorrect diagnosis, poor quality of life, and the challenging costs of therapies. Expertise constraints mark a crucial factor holding back this vulnerable population from prompt treatment.[2] Lack of funding or lower return on investing in rare disease research are important factors that are hindering advancements. Aside from rare psychiatric disorders, patients with other rare diseases are also highly likely to experience high rates of psychological distress due to the complicated nature of symptoms and difficulty in attaining correct and timely diagnosis and treatment.[3] A review exploring the utility of artificial intelligence for rare diseases noted that algorithms trained using datasets from patients with rare diseases can be used to identify new cases efficiently, for example, a combination of brain function and structural imaging data can determine whether a person would receive the diagnosis of Huntington disease in 5 years. Models have been developed that utilize genetic data to provide an accurate diagnosis. As nearly 80% of rare diseases are genetic, this area has huge potential. AI has also been shown to aid treatment development; the same methodology can be applied for the development of treatments for rare diseases.[4] A study found that genetic disorders are more prevalent in the psychiatric population.[5] Compiling datasets from rare psychiatric disease populations all over the world and building AI models based on them is the need of the hour. Models that can predict diagnosis and can help in personalized medicine for patients with rare psychiatric diseases can shift the dynamics of clinical outcomes for rare diseases. A scarce dataset on rare diseases can lead to biased algorithms, exacerbating disparities in healthcare. Therefore, to harness the

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true potential of AI and create more robust AI models, establishing a global collaborative infrastructure is essential. Governments should prioritize funding and research for rare disease research within AI initiatives to encourage innovation.

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