

The Future of Psychiatry with Artificial Intelligence: Can the Man-Machine Duo Redefine the Tenets?

Будущее психиатрии с искусственным интеллектом: может ли союз человека и машины перевернуть парадигму?

doi: 10.17816/CP13626

Short communication

Jyoti Prakash Sahoo¹, Birendra Narayan²,
N Simple Santi²

¹ Kalinga Institute of Medical Sciences, Bhubaneswar, India

² Veer Surendra Sai Institute Of Medical Science And Research,
Burla, India

Джьоти Пракаш Саху¹, Бирендра Нараян²,
Эн Симпл Санти²

¹ Институт медицинских наук Калинги,
Бхубанесвар, Индия

² Институт медицинских наук и исследований
Виры Сурендры Саи, Бурла, Индия

ABSTRACT

As one of the largest contributors of morbidity and mortality, psychiatric disorders are anticipated to triple in prevalence over the coming decade or so. Major obstacles to psychiatric care include stigma, funding constraints, and a dearth of resources and psychiatrists. The main thrust of our present-day discussion has been towards the direction of how machine learning and artificial intelligence could influence the way that patients experience care. To better grasp the issues regarding trust, privacy, and autonomy, their societal and ethical ramifications need to be probed. There is always the possibility that the artificial mind could malfunction or exhibit behavioral abnormalities. An in-depth philosophical understanding of these possibilities in both human and artificial intelligence could offer correlational insights into the robotic management of mental disorders in the future. This article looks into the role of artificial intelligence, the different challenges associated with it, as well as the perspectives in the management of such mental illnesses as depression, anxiety, and schizophrenia.

АННОТАЦИЯ

Ожидается, что в течение ближайшего десятилетия распространенность психических расстройств, которые несут наиболее существенный вклад в уровень заболеваемости и смертности, возрастет в три раза. Основными препятствиями в психиатрической помощи являются стигматизация, недостаточное финансирование, нехватка ресурсов и психиатров. Сегодняшние дискуссии сосредоточены на том, каким образом машинное обучение и искусственный интеллект могут повлиять на качество оказания помощи психиатрическим пациентам. Чтобы выявить актуальные проблемы, касающиеся доверия, конфиденциальности и автономии, необходимо изучить их социальные и этические аспекты. Более того, в работе искусственного интеллекта могут наблюдаться сбои и отклонения в «поведении». Глубокое философское понимание этих характеристик как человеческого, так и искусственного интеллекта может установить новые корреляции, проливающие свет на перспективы роботизированного лечения психических расстройств. В настоящей статье представлено описание роли искусственного интеллекта, различных сложностей и перспектив в лечении психических заболеваний, таких как депрессия, тревога, шизофрения.

Keywords: AI & robotics; mental illness; virtual clinic; digital era; deep learning

Ключевые слова: искусственный интеллект и робототехника; психические заболевания; виртуальная клиника; цифровая эра; глубокое обучение

INTRODUCTION

It appears that we have entered the era of the digital revolution, coming on the heels of the mechanical, electrical, and Internet eras. Today artificial intelligence (AI) tools are available for the diagnosis of behavioral issues, analysis of their manifestations, the prediction of the course of diseases, and the conduct of psychoeducation [1]. The global incidence of psychiatric disorders has skyrocketed in the past two decades. By some estimates, around 500 million individuals have struggled with one or another mental illness [2]. According to the World Health Organization (WHO), mental illnesses will surpass the ischemic heart disease as the biggest drivers of morbidity in the world in the coming years [3, 4].

AI and future technological breakthroughs are anticipated to improve access to care and the quality of the care available to patients suffering from psychiatric disorders. Nonhuman robotic or virtual applications in psychological care may become the preferred means for some, as those have the potential to minimize the feeling of embarrassment that may come with seeking care or adhering to a treatment regimen [5, 6]. The adoption of AI in mental health can also have the added benefit of helping to empower specific patient populations (for instance, those who are less accustomed to navigating the healthcare system), fostering greater transparency and trust between patients and the health care system. Plenty of AI applications are self-administered, enabling people who do not have a life-threatening medical condition to choose therapies without encountering the tedious process of being clinically evaluated and admitted to a health care facility. This is another significant benefit of AI applications [5, 7]. Last, but not least, there are additional advantages that come with having a virtual or robotic therapist who remains easily accessible, has inexhaustible patience and energy, remains aware at all times of what a patient has stated, and does not criticize or judge. Thus, AI could help by offering a service that is extremely trustworthy and, especially, beneficial to particular groups of patients [8].

AI-powered programs might deal with people with mild to moderate depressive disorder, anxiety, and other non-acute illnesses if they are incorporated into global health care services. This would allow medical professionals to devote themselves more to the harder-to-treat cases. These are significant advantages worth taking into account given the worldwide growing burden of mental illnesses and the limited resources available.

Achieving maximal research and clinical practices for the cutting-edge treatment of psychological care in the near future mandates a deeper understanding of the ethical and social repercussions of integrated AI. As psychiatrists and psychologists, we must not shun AI, but embrace its present and foreseeable applications, and be ready to work hand-in-hand with AI when it becomes an established therapeutic tool [5, 6, 9].

AI AND PSYCHIATRY

In the technical language, the acronym “AI” indicates an algorithm that can justify, learn, and plan and exhibit actions that we observe with biologically intelligent systems. The term “machine learning” denotes a method of programming in computer science where an application can adjust itself (i.e., learning) according to its inputs in lieu of having all of its behavior dictated by the code. “Deep learning” is a unique kind of machine learning that frequently uses artificial neural networks as a model. The latter usually serves as the artificial neurons and entails interconnected nodes with an input layer, hidden layers, and an output layer. Data from the input layer is transformed multiple foists in the hidden layers. Since AI has the capacity to learn, it can perpetually get better [10].

Incorporating AI technology facilitates the generation of more accurate screening tools and risk models that gauge a person’s propensity for or likelihood of being diagnosed with mental health problems. There are basically two types of prospective applications for AI in psychiatry. First is natural language processing, which permits systems to comprehend, decipher, and modify spoken words. Chatbots are a classic example of an AI-based application. These digital conversational agents can communicate via text, speech, or both to simulate human behavior. They serve as a way to offer psychological assistance to those who have trouble sharing their emotions with strangers or in places with limited access to medical facilities. The second application of AI is the combined evaluation of multiple biomarkers utilizing AI to categorize various diseases [11, 12].

CONUNDRUMS

Psychiatrists face challenges using such tools in the following six distinct avenues. The first pertains to the outlooks on AI by psychiatrists and psychologists. Their main problems are the unwillingness to entertain the possibility of employing AI in the coming years [10, 13].

The second is the feeling that, despite having knowledge, skills, experience, and expertise, one remains outdated. The third one is AI-inherent bias. Because of the prejudices of their programmers, AI systems can inadvertently become biased. Nevertheless, with the introduction of self-learning algorithms, AI systems might actually develop bias depending on the information it is gaining insight from [14]. The rampant use of social networking sites to express thoughts and emotions amid the backdrop of four-walled homes and hospitals is the fourth. The management of mental illnesses and the reliability of AI's nosology come together in the fifth. The acceptance of AI by the rural populace ranks sixth [15, 16].

The algorithms used to forecast or diagnose mental illnesses must be accurate and refrain from putting patients at a higher risk if responsible AI deployment is to be accomplished. The possibilities for AI-based neurotechnology to confine psychiatric patients within the neuroscientific principles might make it both theoretically advantageous and therapeutically pertinent, while also fraught [6, 17]. Thus, we contend that the latest technological innovations should only be incorporated into clinical practice if they satisfy each of the following three criteria: they must serve human purposes, they must respect individual identities, and they must foster interaction with humans. The ethical framework for AI applications extends beyond the humanitarian imperative. On the contrary, the core notion of humanity is the kernel of the other five concepts, which are accountability, information, transparency, consensus, and participation [18, 19].

FUTURE PERSPECTIVES

Research into the qualitative dimensions of AI in mental health, in addition to factual and theoretical studies on the relationship between innovation and societal transformation, from the spectrum of frontline deployment up to the domain of national policy making, must be conducted to address these issues. The cutting-edge character of AI will substantially transform the academic medicine's norm-setting, which will eventually be adapted. Since mental patients constitute a particularly vulnerable demographic, their privacy and ethical concerns will be the greatest hurdle [6, 10, 20].

A founding principle of clinical deontology and the vitality of the patient-practitioner relationship are opportunities to be highlighted here. The foundational teaching model should be a balance between the possible mitigation

that AI platforms could provide and the addressing data privacy concerns [21]. Such tailored educational resources should be as practical as they are feasible at all times to be effective. Providing students with hands-on involvement with the development, utilization, as well as assessment of AI applications in psychiatry is one way to do that.

To reduce the problems with public health or evidence-based medicine, AI techniques can be highlighted as a primary option among several. Hackathons, which are small-team programming competitions with a specific theme, have recently become popular across every level of academia as a way to involve diverse groups of people (medical and engineering students, scientists, entrepreneurs, etc.) in an entirely novel format ensuring that medical innovation education is accessible and straightforward for curricular medical centers to adopt [10, 22]. Psychiatric departments must adopt multidisciplinary tools such as statistics, technology, and ethics or explore building such skills internally. It is an impediment to the training of future psychiatrists for AI.

CONCLUSION

This article has covered various pluses and minuses of AI as it relates to psychiatry. Changes to psychiatrists' responsibilities, professional status, and purview, which are inextricably tied to issues of socialization and training, have been addressed here. Viewing psychiatry as an integral part of a larger societal construct instead of operating within an academic "bubble" may be extremely helpful in addressing these issues. Additionally, the continual development and evaluation of AI applications has laid the groundwork for a tremendous revolution, even though it isn't currently influencing mainstream practice.

Psychiatrists deserve to be permitted to engage with this paradigm shift. In the domains of health, finance, priority setting, resource allocation, and labor management, AI can supplement the job of managers and even substitute them in certain instances. We have to consider how AI could help shape our present and future worldview. The principles that will undergird our future autonomous health care system are currently being redefined, and we should seize the initiative rather than be simple bystanders.

Article history:

Submitted: 11.09.2023

Accepted: 15.09.2023

Published Online: 25.09.2023

Authors' contribution: Jyoti Sahoo and Birendra Narayan contributed significantly towards the conception and design of this review article on the impact and role of artificial intelligence in psychiatric illnesses. Jyoti Sahoo and N Simple Santi conducted the literature search and were involved in the acquisition of information regarding artificial intelligence in psychiatric illnesses. Jyoti Sahoo was the major contributor in the writing of the manuscript. All three authors contributed in the drafting, revising the article, and approved the final manuscript sent for publication. All the authors are responsible for the content and similarity index of the manuscript.

Funding: The research was carried out without additional funding.

Conflict of interest: The authors declare no conflicts of interest.

For citation:

Sahoo JP, Naik BN, Santi NS. The future of psychiatry with artificial intelligence: can the man-machine duo redefine the tenets? *Consortium Psychiatricum*. 2023;4(3):CP13626. doi: 10.17816/CP13626

Information about the authors

***Jyoti Prakash Sahoo**, MD, Department of Pharmacology, Kalinga Institute of Medical Sciences; ORCID: <https://orcid.org/0000-0002-1721-4836>
E-mail: drjp1111@gmail.com

Birendra Narayan Naik, MD, Department of Psychiatry, Veer Surendra Sai Institute Of Medical Science And Research

N Simple Santi, MD, Department of Pharmacology, Veer Surendra Sai Institute Of Medical Science And Research

*corresponding authors

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