

ARTIFICIAL INTELLIGENCE FOR WOMEN'S PSYCHOLOGICAL WELLBEING

Usha Rana¹ & Rupender Singh²

¹ School of Humanities and Social Sciences, Dr. Harisingh Gour Central University, Sagar-470003, Madhya Pradesh, India

² Department of Electronics and Communication Engineering, Indian Institute of Technology, Roorkee, India

* * * * *

Dear Editor,

Artificial Intelligence (AI) is rapidly transforming various fields, including healthcare (Deep Longevity LTD, 2022). The use of AI in women's psychological wellbeing has gained significant attention in recent years. AI has the potential to revolutionize the way we understand and treat women's mental health conditions. This letter aims to explore the use of AI in women's psychological wellbeing and discuss their current applications, challenges, and future research directions.

Mental health conditions are a significant public health concern, affecting millions of people worldwide, with women being disproportionately affected. Depression, anxiety, and other mental health disorders are among the leading causes of disability and morbidity in women (Rana & Govender, 2020; Rana, 2020). The use of AI in women's psychological wellbeing has the potential to transform the way we diagnose, treat, and manage mental health conditions in women.

Applications and Challenges

AI refers to the development of computer systems capable of performing tasks that typically require human intelligence and has shown promising results in the diagnosis, treatment, and management of mental health conditions such as person's emotional, psychological, and social well-being. AI technologies transcend gender-based differentiations linked to socially constructed norms, behaviors, and expectations traditionally ascribed to individuals based on their gender identity. By leveraging AI technologies, personalized and inclusive mental health support can be provided to women, addressing the unique challenges and experiences they face in relation to mental health. For instance, AI-based chatbots and virtual assistants can provide women with personalized mental health support and guidance (Gavrilova, 2022). These chatbots and virtual assistants can provide women with a safe and private space to discuss their mental health concerns and receive appropriate support and interventions.

AI can also be used to develop predictive models for mental health conditions in women. These predictive models can help identify women at risk of developing mental health conditions, enabling early interventions to prevent the onset of these conditions.

While AI show great promise in women's psychological wellbeing, several challenges need to be addressed before they can be widely adopted. One significant challenge is the lack of diversity in the datasets used to develop these models. Most datasets used to develop AI models are primarily based on Western populations, limiting their generalizability to other populations.

Another challenge is the need for the transparent and ethical development and the use of these models. AI models are only as good as the data used to train them, and biases in the data can result in biased outcomes. Therefore, it is essential to develop AI models that are transparent, explainable, and ethically developed and used.

Future Research Directions

Here are some future research directions that could advance the use of AI in women's psychological wellbeing:

- 1. Developing more diverse datasets:** Future research should focus on developing more diverse datasets that accurately represent the experiences of women from different ethnic, cultural, and socio-economic backgrounds. This can help ensure that AI models are more inclusive and can provide personalized mental health support to a broader range of women.
- 2. Ensuring transparent and ethical development and use of AI models:** Future research should focus on developing AI models that are transparent, explainable, and ethically developed and used. This includes developing models that can be audited to ensure that they are not biased or discriminatory and that they are used in an ethical and responsible manner.
- 3. Developing AI-based interventions for women with specific mental health conditions:** Future research should focus on developing AI-based interventions for women with specific mental health conditions, such as depression, anxiety, and post-traumatic stress disorder. These interventions can provide personalized and effective support to women, leading to better mental health outcomes.
- 4. Integrating AI into mental health care systems:** Future research should focus on integrating AI into mental health care systems to improve the quality and accessibility of mental health care for women. This can include developing AI-based tools and technologies that can assist mental health care providers in diagnosing and treating mental health conditions in women.
- 5. Exploring the impact of AI on women's mental health:** Future research should also focus on exploring the impact of AI on women's mental health, including the potential benefits and risks associated with the use of these

technologies. This can help ensure that AI is used in a way that promotes women's mental health and wellbeing.

The utilization of AI in women's psychological wellbeing demonstrates immense potential to revolutionize the diagnostic, therapeutic, and management approaches for mental health conditions in women. AI has the capability to offer personalized and efficient mental health support, as well as aid in the prevention of such conditions. However, it is crucial to tackle the existing challenges to fully unlock the benefits of AI in women's psychological wellbeing. Future research endeavors should prioritize addressing these challenges, ensuring ethical and transparent utilization of AI to advance women's mental health and overall well-being. Additionally, it is imperative to critically examine the potential impact of patriarchization on the development and deployment of AI systems, striving for gender

equality and the avoidance of reinforcing biases and discriminatory practices.

References

1. Deep Longevity LTD. Harvard Developed AI Identifies the Shortest Path to Human Happiness. *SciTechDaily* 2022. <https://scitechdaily.com/harvard-developed-ai-identifies-the-shortest-path-to-human-happiness/>.
2. Rana U & Govender J. Indian Women's mental calamity: A shadow pandemic. *Asian J Psychiatr* 2020; 54:102308. doi: 10.1016/j.ajp.2020.102308.
3. Rana U. Psychosocial Consequences of COVID-19 on Sex Workers: A Global Perspective. *Psychiatr Danub* 2020; 32:590-592.
4. Gavrilova Y. AI Chatbots & Mental Healthcare. *IOT for All* 2022. <https://www.iotforall.com/ai-chatbots-mental-healthcare>

* * * * *

WHAT IS THE ROLE OF MITOCHONDRIA IN THE PATHOLOGY OF SCHIZOPHRENIA AND THE MECHANISM OF ACTION OF ANTIPSYCHOTICS?

Svjetlana Loga-Zec¹, Amra Memić-Serdarević²,
Orhan Lepara³, Gorana Sulejmanpašić⁴,
Nataša Loga-Andrijić⁵

¹ Department of Pharmacology, Clinical Pharmacology and Toxicology, Faculty of Medicine, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

² Department of Psychiatry, Clinical Center University of Sarajevo, Sarajevo, Bosnia and Herzegovina

³ Department of Physiology, Faculty of Medicine, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

⁴ Department of Psychiatry, Clinical Center University of Sarajevo, Sarajevo, Bosnia and Herzegovina

⁵ Department of Neurology, Clinical Center University of Sarajevo, Sarajevo, Bosnia and Herzegovina

* * * * *

Dear Editor,

Mitochondria are known to play a key role in neurodevelopment and numerous data show that abnormalities in the structure and function of mitochondria could be associated with the development of schizophrenia. Also, mitochondria have a general role in cellular metabolism and signaling pathways. Metabolic dysfunction was also observed to be a common thread in multiple studies of human schizophrenia patient tissue. Given that antipsychotic drugs have been shown to alter transcription and protein abundance of several of the specific genes indicated in mitochondrial and metabolism defects, the cellular processes regulating metabolism appears to be a site of interplay

between known schizophrenia pathology and the action of antipsychotic drugs. Epidemiological evidence suggests that schizophrenia is caused by pathogenic genes found in mtDNA that may survive through the matrilineal inheritance pathway (Xu & Yang 2022). Mitochondria have been linked to the etiology of schizophrenia (SZ). However, studies of mitochondria in SZ might be confounded by the effects of pharmacological treatment with antipsychotic drugs (APDs) and other common medications.

A review of recent research shows that chronic administration of antipsychotics causes structural and functional changes in mitochondria and affects the processes of apoptosis and autophagy. Findings of some in vivo investigational drugs showing effects in patients provide further evidence that mitochondria are a relevant target for psychotropic drugs. Also, in responding patients, short-term treatment was not sufficient to ameliorate mitochondrial dysfunction, while a prolonged drug treatment restored mitochondrial function. Understanding the nature of these changes may contribute to the elucidation of new strategy for drug development, to improvement of mitochondrial function.

Numerous studies have demonstrated reduced activities of complex IV and complex I + III in the frontal cortex and caudate tissues, as well as diminished activities of complex IV and complex III in the basal ganglia and temporal cortex, among individuals diagnosed with schizophrenia. Furthermore, decreased complex I activity has been observed in the prefrontal cortex of individuals with bipolar disorder. In addition, postmortem analyses of brains from individuals with schizophrenia frequently reveal atypical mitochondrial ultrastructure and morphology. (Ni et al. 2022).

Studies on mitochondria in SZ, however, may be complicated by side effects from antipsychotic drugs (APDs) and other widely used prescription pharmaceuticals (Chan et al. 2020).