Chapter 11
Artificial Intelligence Technologies in Mental Health: Transforming Depression Care Through Innovation

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ABSTRACT

This chapter explores the incorporation of artificial intelligence (AI) into mental health care, with a particular focus on managing depression. AI has significantly enhanced the promotion, detection, diagnosis, treatment, and monitoring of depression by leveraging technologies such as machine learning, natural language processing, and wearable devices. This chapter also discusses various AI-driven approaches, including the analysis of questionnaires, medical records, social media, speech data, electroencephalogram, magnetic resonance imaging, chatbots, virtual reality, face analysis, robots, multimodal methods, and wearable devices. Each of these technologies offers unique benefits, such as increased accuracy in detecting depression, personalized treatment plans, and continuous patient monitoring. However, the challenges linked to AI in mental health, such as data privacy issues, biases in algorithms, and the complexity of human emotions. The chapter concludes by highlighting the opportunities and future research directions and innovation for AI in enhancing of depression care.

INTRODUCTION

Depression Problems in the World

The vigorous situation of the inner stability that equips someone to utilize his or her capacity in balance to the society values is called mental health. The notion of a "dynamic condition of internal stability" reflects that different life stages require changes in the achieved stability: teenage crises, working life, matrimony, parenting, and retired years are some examples of life stages involving a dynamic exploration for a new mental balance. Four key elements of mental health include fundamental cognitive and social abilities, the capacity to identify and express emotions, adaptability in social roles, and a balanced relationship between the body and mind (Abd El-Hay, 2019). These four components can contribute to different levels of balance, which if any component is not fully functioning, can cause disturbances in other aspects of mental functioning and expanding mental illness.

Mental illnesses are a diverse range of conditions that impact individuals' thinking, feelings, or behavior. They can affect day-to-day functioning, relationships, and overall quality of life. Depression, or major depressive disorder, is a prevalent and serious mental condition that negatively impacts a person's emotions, thoughts, behaviors, and overall perspective on life (Kropotov, 2009). The characterizations of depression can be detected as unhappiness, uninterested in contentment, guilty feelings or hesitation, problems in resting and taking some food, and low focus. Depressive episodes can be classified as light, medium, or tempestuous; and dysthymia, tenacious or immedicable of light depression. The dysthymia symptoms are almost identical to the depressive occasion, yet it seems to be mild and abiding. Depression