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The use of artificial intelligence in diagnosis and psychotherapy

استخدام الذكاء الاصطناعي في التشخيص والعلاج النفسي

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Abstract

The study aims to address the topic of artificial intelligence and its application in psychology, focusing on how these advanced technologies can be used to improve diagnosis and psychotherapy, as well as exploring the benefits and challenges associated with the use of artificial intelligence, in addition to the integration of these technologies with traditional psychotherapy.

The study concluded that artificial intelligence offers significant potential in psychological diagnosis by analyzing big data and providing important tools in psychotherapy, in addition to the necessity of integrating human psychological treatment efforts with artificial intelligence, as well as taking into account the ethical and social controls for the use of artificial intelligence and its application in psychology.

Keywords : artificiel intelligence, diagnosis, psychotherapy,

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ملخص:

تهدف الدراسة الى تناول موضوع الذكاء الاصطناعي وتطبيقه في علم النفس مع التركيز على كيفية استخدام هذه التقنيات المتقدمة في تحسن التشخيص والعلاج النفسي، واكتشاف الفوائد والتحديات المرتبطة باستخدام الذكاء الاصطناعي، اضافة الى التكامل بين هذه التقنيات مع العلاج النفسي التقليدي.

توصلت الدراسة الى ان الذكاء الاصطناعي يوفر امكانات كبيرة في التشخيص النفسي من خلال تحليل البيانات الضخمة وتوفير ادوات هامة في العلاج النفسي، اضافة الى حتمية دمج جهود العلاج النفسي البشري مع الذكاء الاصطناعي، كذلك مراعاة الضوابط الاخلاقية والاجتماعية لاستخدام الذكاء الاصطناعي وتطبيقه في علم النفس.

الكلمات المفتاحية: الذكاء الاصطناعي ، التشخيص، العلاج النفسي.

I- Introduction :

Artificial intelligence (AI) is one of the most prominent technological developments in science. Artificial intelligence is software that aims to mimic human abilities in thinking, learning and decision-making, enabling it to process and analyses huge amounts of data faster than humans can do at the same time.

In the field of psychology, artificial intelligence is one of the modern tools that have contributed to improving the understanding of human behavior. Artificial intelligence technologies can provide solutions for understanding and analyzing these mental and psychological processes. Intelligent systems can also be used to analyses responses to psychological tests, which enhance the accuracy and objectivity of the assessment and reduce bias and subjectivity that may affect the results. It can also play a role in psychological treatment by providing digital platforms that manage therapeutic sessions that diagnose specific cases using intelligent tools based on data analysis.

Artificial intelligence can also be used in psychology to develop diagnostic tools that can contribute to accelerating the early diagnosis of mental disorders such as depression and anxiety disorders.

However, the application of artificial intelligence in psychology faces many ethical and social challenges, particularly with regard to privacy and data security, with growing fears of the exploitation of personal data in unethical practices or unscientific decisions based on algorithms. It is therefore necessary to use these technologies in a way that respects human values and strikes a balance between the benefits and ethical controls in psychology.

Based on the above, this study aims to highlight the potential application of artificial intelligence and its benefits in psychology by analyzing how these technologies can be integrated with the human application of psychology in diagnosis and psychotherapy, opening up new horizons for scientific research in this field and the ability to adapt the research standards and ethics in psychology by asking the following question:

- What is the role of artificial intelligence in diagnosis and psychological treatment, and what are the ethical and social challenges facing its use?

Importance of the study:

The study highlights the importance of artificial intelligence as a tool in the field of psychology for diagnosis and psychotherapy.

It also highlights the need to address the ethical and social challenges associated with the use of this technology.

The study provides a better understanding of how artificial intelligence interacts with traditional psychological principles and clarifies the extent to which these technologies can be relied upon in therapeutic and diagnostic methods.

- Study terms:

Artificial intelligence:

It is a branch of computer science that aims to build systems capable of simulating human intelligence, including the ability to learn, think, analyses, and make decisions based on data. In the field of psychology,

artificial intelligence is used to analyses psychological data and provides. (Mccorduck, 2004)

Artificial intelligence applications:

Refers to the use of artificial intelligence in various scientific fields such as education, medicine, and psychology. In psychology, artificial intelligence is used to analyses data, automatically diagnose mental disorders, and provide digital treatments and Therapeutic solution.

Psychology:

is the science that studies human behavior and psychological phenomena. It has many branches, such as general psychology, clinical psychology and industrial psychology, as well as everything related to psychological aspects, such as psychological factors and psychological schools, such as psychoanalysis, behaviorism and Gestalt. It also deals with psychological tests, including: intelligence and personality tests. (Mccorduck, 2004)

I.1. artificial intelligence:

The emergence of artificial intelligence came after a long history of scientific research and development dating back to ancient times, when ideas about robots and self-propelled objects were part of myths and stories. Humans never gave up on their dream of achieving this until, in the middle of the last century, they were able to develop the first concept of artificial intelligence.

Computers: In the 1940s and 1950s, computers such as the famous Turing computer were developed, and these computers became the basis for understanding the power of automatic processing and calculation. (McCorduck, 2004)

The Dartmouth Conference: Held in 1956, this conference marked the beginning of the field of artificial intelligence, where a group of

scientists gathered to discuss the idea of machines that mimic human thinking. (McCarthy, 2006)

Algorithm development: In the years that followed, numerous algorithms were developed that enabled computers to learn specific skills, such as neural networks and deep learning.

Big data: In the last two decades, data has become available in large quantities, leading to rapid development in artificial intelligence and machine learning technologies. (Hennessey, 2011)

Technical and ethical challenges*:*

Despite the many benefits that artificial intelligence offers in psychological assessment, it faces numerous technical and ethical challenges that must be addressed to ensure its fair and effective use.

Algorithmic systems: Data that is not parallel or representative of all groups may lead to unfair or distorted results. If the data used does not take into account diversity factors such as race, gender, or social background, the results may be biased. In psychological diagnosis, overcoming this challenge requires diversifying the data and applying objective techniques.

Lack of transparency: Many AI systems rely on complex algorithms such as deep neural networks, which are often described as black boxes, meaning that it is difficult to understand how decisions are made, raising doubts about the reliability of psychological assessments and the extent to which they can be trusted. (Burrell, 2016)

Privacy issues: Artificial intelligence applications in psychological assessment rely on the collection and analysis of large amounts of personal data, which requires strict ethical controls to protect individuals' privacy and ensure that sensitive information, is not misused, disseminated or sold. Please encrypt data and obtain explicit consent from individuals before collecting their data, and implement a strict policy of deleting data after use. (Floridi, 2018)

. 2. Applications of artificial intelligence in psychology:

These applications aim to enhance the ability of psychology professionals to diagnose and treat mental disorders using tools and techniques based on algorithms and big data. They include the following tasks.

Text analysis: This application involves the use of artificial intelligence to analyses written or narrated texts in order to identify emotions and psychological states. Texts and posts on social media can be analyzed, or digital questionnaires can be used.

Techniques such as machine learning are used to analyses texts and identify emotional patterns. For example, signs of depression or anxiety can be detected by analyzing the frequency of certain words .

These technologies are applied in the diagnosis of depression and anxiety, as well as in monitoring treatment progress. Applications such as 'Woebot' can interact with patients and diagnose emotional states and mood disorders based on the results of their responses.

A study by Pennebaker et al. (2015) indicates that text analysis using artificial intelligence can detect emotions such as depression, allowing doctors to provide early interventions, improve diagnosis, and offer psychological solutions. (Pennebaker, 2015)

A. **Automated diagnosis:**

Automated diagnosis relies on the use of artificial intelligence algorithms to analyses patient data such as medical history, psychological tests and clinical interviews, to provide preliminary diagnoses of mental disorders and contribute to improving the accuracy of diagnoses and reducing human error.

These applications help speed up the diagnostic process, especially in areas with a shortage or lack of mental health professionals. These systems can also be used to provide accurate diagnoses for disorders

such as borderline personality disorder, autism and depression. (Baker, 2014)

In a 2014 study by Baker & Siemens, which reviewed how artificial intelligence can improve the accuracy of initial diagnoses of mental disorders, it was shown that automated algorithms can produce results similar to those produced by human doctors in some cases. (Baker, 2014)

B. **Digital therapy :**

Digital therapy refers to the design of therapeutic programs based on artificial intelligence to provide specialized psychological treatments based on an analysis of the patient's condition. These include digital programs for cognitive behavioral therapy, which interact with patients, provide them with strategies and suggest programs to improve their psychological condition through interactive sessions.

The applications take the form of individual treatment programs for people suffering from disorders such as anxiety and depression, programs for coping with everyday stress, and programs such as wysa and replika, which help patients, improve their mental state using intelligent interactions.

Studies by Baker & Siemens (2014) have confirmed the effectiveness of digital therapy in improving the condition of patients suffering from depression and anxiety. These programs can be used as an alternative or complementary program to traditional therapy in cases where appropriate medical care is not available. (Baker, 2014)

II– Methods and Materials:

This study adopts a theoretical analytical approach by reviewing scientific literature and previous studies related to artificial intelligence in psychology, analyzing research that has addressed intelligent systems in psychological measurement, and highlighting the challenges faced in its use and what has been achieved in this field.

III- Results and discussion :

The study results showed that artificial intelligence offers enormous potential for improving psychological measurement tools by enhancing the accuracy of results, reducing subjectivity, and analyzing big data. However, significant challenges remain with regard to technical systems and algorithmic biases, in addition to ethical issues related to privacy and objectivity:

Artificial intelligence in its application to psychology relies primarily on data obtained to analyses psychological behavior and provides diagnoses, taking into account the differences between cultures, values and traditions that influence the emergence of psychological symptoms and how to deal with them. Intelligent systems must adapt to these differences in order to provide accurate and effective diagnoses. (Baker, 2014)

This finding is consistent with the conclusion reached by Abdullah's 2021 study that intelligent systems can face significant challenges when they are not supported by data that represents cultural diversity, as psychological symptoms differ between Western and Eastern cultures in terms of their interpretation and causes. To improve the adaptation of artificial intelligence to cultural diversity, interactive systems can be developed that use continuous integration to adapt to local cultural patterns. This is also consistent with the 2021 study by Abdel rahman, which proposes techniques to promote cultural values in the algorithms used to diagnose mental illnesses. (N, 2021)

The results of the study also show that psychotherapy relies primarily on building a therapeutic relationship between the therapist and the patient. This relationship contributes to building trust and providing a safe environment for the patient to express their feelings. This is consistent with the findings of Al-Otaibi's 2023 study, which indicated that artificial intelligence can provide support tools for regular psychotherapy, such as smart Chabot’s that can provide guidance or contribute to managing sessions. However, artificial intelligence cannot provide the deep human relationship that traditional psychotherapy is based on, as it requires deep understanding and listening that cannot be

fully simulated by smart systems. Therefore, at present, artificial intelligence can be an aid to psychotherapy but cannot completely replace human therapists. It can contribute to the analysis of big data, especially in psychological studies and the analysis of questionnaires, test results and measurements. However, the ability to deal with deep psychological and emotional challenges remains within the scope of human therapists. Therefore, artificial intelligence must be integrated with traditional therapies rather than completely replacing them. (Burrell, j. 2016).

IV- Conclusion:

Artificial intelligence is a powerful tool for improving psychological assessment and psychotherapy, but its use requires consideration of technical and ethical challenges to ensure the objectivity and reliability of results by improving the quality and speed of big data reading and enhancing transparency. A balance can be achieved between utilizing this technology and ensuring that individual and cultural differences are taken into account and that balanced care is provided, combining technical and psychological aspects, this will achieve effective integration between artificial intelligence and psychology, enhancing the effectiveness of psychological treatment while preserving ethical and social values, ensuring a healthy and safe environment for patients

Based on the above, the researcher believes that the following recommendations should be addressed*:*

-Developing culturally diverse artificial intelligence systems that take into account cultural differences in diagnosis and psychological treatment.

-Integration between scientists in the fields of artificial intelligence and psychology to create multiple research projects aimed at developing algorithms capable of adapting to multiculturalism.

-Monitoring the long-term psychological effects of using artificial intelligence and continuing to monitor and track patients by human therapists while using these intelligent systems. (N, 2021)

-Enhancing professional training and continuing education for mental health practitioners in the use of artificial intelligence.

-Establishing ethical and legal controls and standards for the use of artificial intelligence in psychiatry and psychology.

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