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REVIEW ARTICLE

Future Directions of Artificial Intelligence in Neurological and Psychological Sciences: A Review of Innovations, Challenges, and Prospective Developments

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ABSTRACT

AI rapidly impacts the neurological and psychological sciences, both positive and negative, as more AI techniques are developed. This review will examine how reformative AI can improve mental health care and neuropsychological evaluations. Cognitive tools, including machine learning systems and therapeutic bots, are changing the approach to treatment and, in particular, the diagnosis of diseases. For example, early intervention in a mental health condition can be conducted when AI presents the results from a large data set where the disease may be concealed. Nevertheless, using AI also causes ethical concerns such as privacy, data pre-processing bias, and, obviously, the concern of validation. Since AI is a rapidly expanding field, it has essential consequences meant to be enacted to govern its safety and efficiency in usage in the clinical area. The future area of research should be aimed at minimizing the divergence between technical potentiality and clinical application of the developed AI so that the decision support is complementary to the existing stock of human expertise. The following review will discuss the current trends, issues, and prospects of neurological and psychological AI applications, focusing on the concept that interdisciplinary cooperation can fully unlock the potential of these developments while recognizing the potential issues. In this way, we must work together for a new era of mental health care that is evidence-based but also ethically sound.

Keywords: Artificial Intelligence ▪ Neuroscience ▪ Psychology ▪ Mental Health ▪ Neuroimaging

1. INTRODUCTION

Artificial Intelligence (AI) has become a modern driving force affecting the development of many fields and disciplines, and neurological and psychological sciences are no exception. AI technology is increasingly being used in applications ranging from diagnosing conditions to identifying new therapeutic approaches for mental health and neuropsychological disorders. This review paper examines the relationship between AI and these essential scientific fields, emphasizing its tremendous potential and promise, while also acknowledging the many challenges associated with its adoption [1].

One of the significant themes of this paper is the impact of artificial intelligence on the radical transformation of mental health services and neuropsychological testing. Sophisticated cognitive instruments, including machine learning models and artificial intelligence therapeutic platforms, facilitate the early identification of ailments using raw and highly diversified datasets. This anticipatory approach represents a clear departure from more conventional ways of thinking and may provide a new avenue for enhancing overall patient health through early detection.

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However, when AI is applied in clinical practice, several ethical issues arise in both developing and developed countries. Data privacy, data bias, and the effectiveness and reliability of AI applications in practice must be discussed and resolved before such technologies can be applied safely. These challenges form part of the broader discussion in this review, which calls for a balanced view of integrating AI into healthcare systems [2].

The review stresses the need to bring the technological sophistication of AI into harmony with its realistic utilization in clinical settings. Closing this gap requires the development of new tools and methods, as well as the successful adoption of AI technologies into prevailing healthcare models without replacing professional expertise. This alignment is crucial to ensure that the benefits of applying AI are supported by effective solutions to the constraints it may present.

Closely related to the competencies examined above, interdisciplinary collaboration recurs throughout the paper as a central theme. The combination of technological advancements, neuroscience, and psychology opens tremendous possibilities for scientific and clinical progress. Nonetheless, unlocking this potential requires international cooperation among researchers, clinicians, ethicists, and policymakers to enhance AI solutions while ensuring their ethical applicability [3].

Ethical concerns are given considerable attention because AI is being applied in such a sensitive area as mental health, where the protection of patients' interests must remain above all other priorities. Well-written rules, strict and efficient procedures for validating AI, and measures to prevent immoral applications are essential for developing public confidence and ensuring the responsible application of AI in neurological and psychological sciences.

The rapid advancement of AI development necessitates governance frameworks that are as adaptable as the technology itself. Policymakers and established regulatory authorities face the challenge of bridging the gap between fostering innovation in AI applications and protecting consumers from potential harm, unreliability, or unfair AI operations. This aspect of governance is crucial for the successful integration of AI into neurological and psychological treatment, particularly in the future. The urgency and importance of this issue cannot be overstated [4].

Given the studies discussed in this paper, it is clear that there is a pressing need to enhance the rationality and interpretability of AI models. This is crucial for advancing AI and refining its application in mental health care. By focusing on these directions, researchers can begin asking questions that lead to the development of solutions capable of improving accessibility to mental health care. The importance of continuous improvement in AI cannot be overstated.

This paper also analyzes the social impact of the broad application of artificial intelligence in these sciences. On the one hand, AI can help ease some of the pressures placed on healthcare organizations once introduced. On the other hand, it raises concerns regarding the invalidation of traditional professional roles and the widening effect of AI on professional practice. These dynamics should be analyzed carefully to ensure that technological progress benefits society [5].

As a result, integrating AI into neurological and psychological sciences represents a new phase filled with opportunities. This advancement, while challenging, holds the promise of significantly improving mental health treatment and expanding our understanding of neuropsychology. However, realizing this potential depends on several factors, including innovation, ethics, and practicality. This paper advocates for the widespread adoption of AI as a social technology and proposes an integrated collaborative practice model based on research evidence. Such a model can help harness AI's full potential in mental health and neuropsychology by effectively managing its benefits and risks.

From a statistical perspective, the integration of artificial intelligence into neurological and psychological sciences is becoming increasingly urgent. The World Health Organization reports that nearly one in seven people globally live with a mental disorder, indicating the broad scale of psychological health needs worldwide. In parallel, neurological conditions represent an even larger public health burden, with more than 3 billion people worldwide living with a neurological condition in 2021. These figures demonstrate that mental and neurological disorders are not limited clinical problems, but major global health challenges that require scalable, accurate, and cost-effective solutions. Therefore, AI-based tools, including machine learning models, neuroimaging analysis systems, and digital mental health platforms, may help address this growing demand by supporting early detection, improving diagnostic accuracy, and expanding access to personalized care. However, the statistical burden also highlights the necessity of validating these technologies carefully to ensure that they are reliable, unbiased, and ethically appropriate before being widely adopted in clinical practice.

Figure 1 presents a direct comparison of the global burden of mental and neurological conditions in 2021. The figure shows that approximately 1.1 billion people worldwide were living with mental disorders, whereas more than 3 billion people were affected by neurological conditions. This difference highlights the substantial pressure imposed by neurological disorders on global healthcare systems, while also confirming that mental disorders remain a major public health priority. These statistics support the need for scalable and reliable artificial intelligence applications in neuroscience and psychology, particularly for early detection, diagnostic support, neuroimaging analysis, and personalized care.

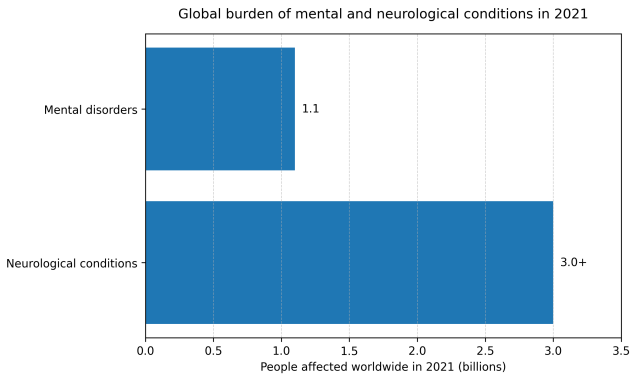


Figure 1. Global burden of mental and neurological conditions in 2021. The figure compares the estimated number of people affected worldwide by mental disorders and neurological conditions.

Figure 2 provides a concise dot-plot representation of the esti-

mated global population affected by mental and neurological conditions. This type of visualization is academically useful because it emphasizes the numerical magnitude of each category without relying on excessive visual decoration. The figure indicates that neurological conditions affected more than 3 billion people globally in 2021, compared with approximately 1.1 billion people living with mental disorders. The scale of these values demonstrates why artificial intelligence is increasingly relevant in neuroscience and psychology, especially for large-scale screening, risk prediction, clinical decision support, and individualized intervention strategies.

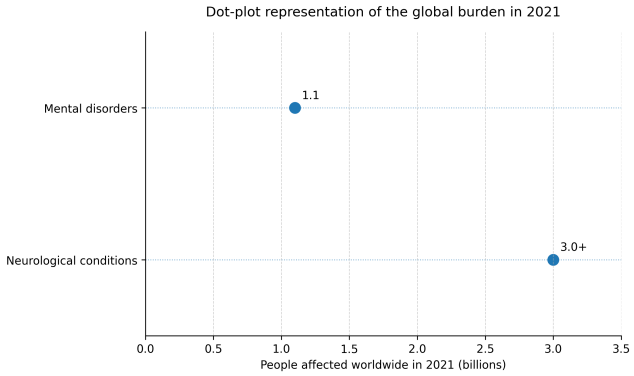


Figure 2. Dot-plot representation of the estimated global population affected by mental disorders and neurological conditions in 2021.

Figure 3 illustrates the gap between the estimated global burden of mental disorders and neurological conditions in 2021. The dumbbell format is particularly useful for showing the distance between two related public health indicators. The figure demonstrates that neurological conditions affect a much larger population worldwide, exceeding 3 billion people, while mental disorders affect approximately 1.1 billion people. Although the neurological burden is numerically larger, both categories represent serious public health challenges. Accordingly, these data reinforce the value of artificial intelligence for improving diagnosis, monitoring, resource allocation, and personalized treatment in neurological and psychological care.

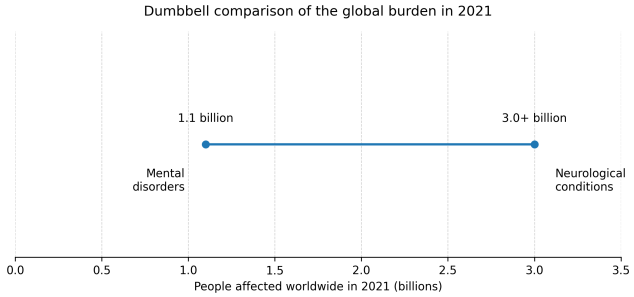


Figure 3. Dumbbell comparison showing the gap between the estimated global burden of mental disorders and neurological conditions in 2021.

2. RELATED WORK

The application of artificial intelligence in neuroscience and psychology has improved research on mental health services, neuropsychological examinations, and diagnosis. Technological progress in this area increasingly helps close the gap between AI possibilities and healthcare practice, making interdisciplinary cooperation essential. This literature review highlights papers focusing on critical issues such as early and precise disease identification, individualized therapy, and ethical concerns related to the use of AI. It synthesizes and organizes findings from multiple domains to illuminate the application of AI in improving precision, efficiency, and accessibility in healthcare. The analyzed literature demonstrates the necessity of maintaining the connection between innovation and patient engagement in order to design effective and sustainable solutions.

Reformative AI can improve mental health care and neuropsychological evaluations by enhancing early intervention through advanced imaging and analytical techniques. As outlined in [6], the current state of in vivo brain imaging, especially functional magnetic resonance imaging (fMRI), is crucial in diagnosing and treating mental illnesses. This study discusses the integration of new methodologies that expand MRI's clinical relevance while addressing ethical concerns and validating AI applications. These advancements promise to harmonize innovation with evidence-based, patient-centered care by bridging the gap between technological potential and practical implementation.

Reformative AI can also improve mental health care and neuropsychological evaluations by integrating advancements in brain research with artificial intelligence to enhance predictive capabilities. As discussed in [7], the historical focus on present and past phenomena within psychology and brain sciences has limited the field's ability to address future challenges effectively. This work synthesizes foundational research by Luria and Pribram on the frontal brain, Sperry and Bogen on hemispheric differences, and von Neumann on AI and systems analysis, proposing a model for brain functioning and forecasting. By leveraging interdisciplinary insights from psychology, philosophy, and cybernetics, the study highlights the importance of advancing predictive methods to address societal turbulence and shape future-oriented research.

Reformative AI can improve mental health care and neuropsychological evaluations by enabling advancements in neuroinformatics that bridge neuroscience and AI technologies. In the research presented in [8], AI algorithms applied to large neuroimaging and electrophysiological datasets uncover patterns that offer new insights into brain structure and function. These developments fuel innovations such as brain–computer interfaces, personalized neuromodulation for neurological disorders, and cognitive enhancement, paving the way for human–machine collaborative systems. By fostering transformative changes in cognitive modeling, decision-making, and mental health interventions, neuroinformatics is positioned to drive augmented intelligence and personalized healthcare while aligning STEM disciplines with foundational brain science.

Reformative AI can improve mental health care and neuropsychological evaluations by integrating advancements across biomedical, psychosocial, and technological research. As detailed in [9], future directions in spinal cord injury (SCI) research emphasize translating basic science into clinical treatments, expanding clinical trials for neurological recovery, and leveraging innovative technologies to restore function. Additionally, psychosocial research underscores the role of

quality of life, environmental factors, and active participation in successful rehabilitation. Technological advances in bioengineering further enhance rehabilitation outcomes, offering high-quality solutions for movement restoration and functional improvement. These multidisciplinary approaches provide a comprehensive framework for addressing SCI rehabilitation challenges.

Reformative AI can improve mental health care and neuropsychological evaluations by enhancing diagnostic accuracy and sensitivity through advanced imaging technologies. In [10], the role of AI in assisting the diagnosis of intracranial aneurysms is explored, highlighting its integration with established diagnostic methods such as computed tomography angiography (CTA), magnetic resonance imaging (MRI), and digital subtraction angiography (DSA). The study emphasizes DSA's superiority in detailing aneurysm structures, particularly the neck, compared with CT and MRI. By combining AI with these imaging techniques, the research identifies opportunities to improve diagnostic precision and underscores the evolving challenges and potential of AI-assisted systems in clinical applications.

Reformative AI can improve mental health care and neuropsychological evaluations by reshaping our understanding of intelligence and creativity through its diverse applications. In [11], Margaret A. Boden explores AI's philosophical and technological challenges, questioning whether programs can achieve genuine intelligence, creativity, or consciousness. Her analysis reveals how AI has deepened our understanding of memory, learning, and language while fueling debates on the nature of the mind and the distinctiveness of human cognition. This perspective underscores AI's dual role as a tool for practical innovation and as a framework for philosophical inquiry into the essence of intelligence.

Reformative AI can improve mental health care and neuropsychological evaluations by leveraging artificial neural networks (ANNs) to expand their applications across various disciplines. As outlined in [12], the history and theoretical foundations of ANNs are reviewed, highlighting their key characteristics: non-linearity, non-limitative capabilities, non-qualitative adaptability, and non-convex optimization. This work emphasizes ANN applications in medicine, information systems, economics, control, transportation, and psychology, illustrating their transformative impact. The study also explores future trends in ANN development, providing insights into their potential to drive innovation and enhance multidisciplinary solutions in artificial intelligence.

Reformative AI can improve mental health care and neuropsychological evaluations by identifying global trends and challenges in AI adoption within healthcare. In the analysis conducted in [13], a comparative case-study approach examines AI applications across developed and emerging markets driven by increasing demand and government initiatives. The study evaluates internal and external factors influencing AI implementation, highlighting advantages, risks, and future directions. Practical recommendations for entrepreneurs on effectively selecting and managing AI tools within healthcare industries are also provided. These findings offer valuable insights for global entrepreneurs, practitioners, and market researchers aiming to optimize AI-driven solutions in healthcare.

Reformative AI can improve mental health care and neuropsychological evaluations by advancing the understanding of memory processes, particularly in older adults and dementia patients. As discussed in [14], the past decade has seen increased interest from psychologists, psychiatrists, and neurologists in addressing concerns related to memory failure and unresolved challenges in diagnosing dementia. The complexity of memory changes, a primary characteristic of dementia, remains insufficiently understood, presenting significant barriers to effective intervention. This focus underscores the critical need for innovative approaches, such as AI, to analyze and interpret the nuances of memory processes for improved diagnosis and treatment.

As outlined in [15], explicit symbolic logic has diminished in prominence, yet the interconnection between AI, digital computation, thought, and the stepwise algorithm remains robust and largely unchallenged. While connectionism offers an alternative, it must be updated because outdated assumptions have also influenced neuroscience, leading to reliance on models that are overly inspired by the three-layer perceptron. Traditional AI has excelled in addressing specific problems and creating systems capable of learning, although often in a narrowly defined manner. However, for tasks requiring vision, learning, and complex motor functions, particularly in robotics, the limitations of traditional approaches remain evident.

As outlined in [16], the conjoint activity of the insula and amygdala is commonly observed during emotional stimulation, particularly in anxiety-related contexts. However, direct connectivity between these regions in such frameworks has not been fully explored. By utilizing resting-state functional MRI and diffusion tensor imaging in 32 healthy participants, the study revealed that functional connectivity between the anterior insula and basolateral amygdala was significantly associated with state anxiety, accounting for 40% of behavioral variance. Additionally, tractography analysis demonstrated a link between trait anxiety and axial diffusivity in a direct pathway between these regions, highlighting their potential as biomarkers for anxiety.

According to the findings in [17], a nationwide survey aimed to identify the most significant problems or needs of individuals living with traumatic brain injury (TBI) compared with individuals with other neurological conditions, mental health conditions, and healthy controls. Among participants with TBI, the most frequently reported problems were money management, none, and anxiety. Across all groups, issues such as money management, work or school, and family or significant relationships emerged as prominent concerns, although their distribution varied. This person-centered approach highlights the critical challenges faced by TBI survivors and offers insights to inform clinical practice and future research.

In [18], a workshop convened by the US Department of Energy's Office of Science program in January 2019 identified priority research directions for in situ data management (ISDM). The study emphasized that ISDM methodologies, which are capable of managing diverse data sources such as simulations, experiments, and sensors, are instrumental in advancing scientific discoveries across various computing scales. These methodologies enhance real-time decision-making, design optimization, and data-driven discovery. Six

priority research directions were highlighted, focusing on making ISDM more pervasive, controllable, composable, and transparent while improving coordination with the software stack and developing novel data algorithms.

As discussed in [19], neurological and psychiatric disorders represent significant global public health challenges due to their severity and economic burden, necessitating advancements in intervention technologies. A bibliometric analysis of patent data revealed a surge in innovation and invention in this field, with China leading as the top patent-priority country and Viscus, a US-based company, emerging as the primary patent holder. The technologies are primarily centered around A61B, which includes diagnosis, surgery, and identification, with decentralized patent distribution in China. This study offers valuable insights into global trends and key technologies for improving the prevention and treatment of neurological and psychiatric disorders.

As outlined in [7], the sciences, including psychology and brain research, have traditionally emphasized understanding phenomena through present and past events, often neglecting future-oriented investigations. This limited temporal focus has contributed to theoretical fragmentation across disciplines and has hindered the social sciences from offering predictive insights that could guide society through significant global changes. The article explores pathways to address this gap by drawing on foundational work by Luria and Pribram on the frontal brain, Sperry and Bogen on hemispheric differences, and von Neumann on artificial intelligence and systems analysis. It presents a philosophically and psychologically grounded model for brain function and forecasting, synthesizing insights from cybernetics, experimental studies, and field research.

As detailed in [20], neuroscience's expanding societal and individual impact underscores the importance of formal education in neuroethics and public engagement for neuroscience students. Such training seeks to heighten students' awareness of the ethical ramifications of neuroscience and encourage reflection on how their research might influence society. Additionally, it fosters a sense of responsibility to communicate novel findings, engage in public discussions, and incorporate societal feedback. While neuroethics and public engagement are distinct, the study emphasizes their complementary roles in preparing future neuroscientists, particularly in interdisciplinary fields such as cognitive neuroscience, social psychology, psychiatry, neurology, psychopharmacology, and genetics.

Future directions in spinal cord injury research are explored from biomedical, psychosocial, and technological perspectives, focusing on contributions from SCI Model Systems research to medical rehabilitation. Biomedical research emphasizes translating basic science into clinical treatments, advancing clinical trials for neurological recovery, developing innovative technologies to restore function, and creating effective outcome measures for interventions. Psychosocial research highlights the role of quality of life, activity, participation, and environmental factors in promoting positive rehabilitation outcomes. Additionally, technological advancements are examined to improve access to high-quality technology, enhance movement restoration, and support rehabilitation efforts through bioengineering innovations.

Table 1 provides a comparative synthesis of the reviewed studies by organizing them according to their research focus, key contributions, applications, and limitations. The table shows that artificial intelligence has been investigated across a wide range of neurological, psychological, and healthcare-related domains, including neuroimaging, neuroinformatics, artificial neural networks, dementia assessment, anxiety biomarkers, traumatic brain injury, and rehabilitation technologies. Overall, the reviewed literature demonstrates that AI can support early diagnosis, improve clinical decision-making, enhance medical-image interpretation, and contribute to personalized treatment strategies. However, the table also reveals several recurring challenges, such as limited clinical validation, data privacy concerns, algorithmic bias, interpretability limitations, and difficulties in translating technological advances into routine healthcare practice. Therefore, the findings summarized in the table emphasize that successful AI integration in neurological and psychological sciences requires not only technical innovation but also ethical governance, interdisciplinary collaboration, and patient-centered implementation.

Figure 4 presents the thematic distribution of the studies included in the literature-review table. The figure shows that the reviewed literature covers several major research directions, including conceptual and predictive AI, clinical diagnosis and neuroimaging, neuroinformatics and data management, rehabilitation, and healthcare implementation. The relatively balanced distribution across these themes indicates that artificial intelligence in neurological and psychological sciences is not limited to a single application area. Instead, it extends from theoretical and philosophical discussions of intelligence to practical clinical applications such as diagnostic support, biomarker identification, data-driven healthcare, and rehabilitation technologies. This thematic diversity reinforces the interdisciplinary nature of AI integration and highlights the need for collaboration among clinicians, neuroscientists, psychologists, data scientists, and ethicists.

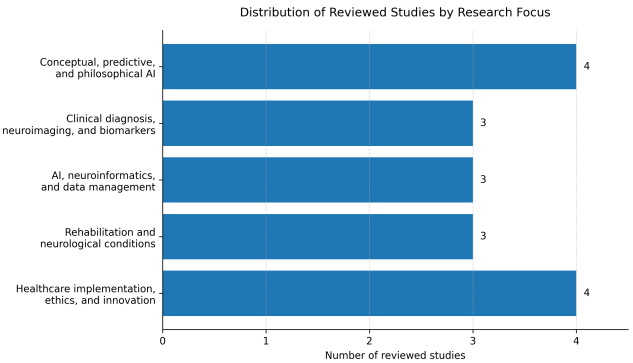


Figure 4. Distribution of reviewed studies by research focus. The figure summarizes the thematic concentration of the studies included in the literature-review table.

3. CONCLUSION

Artificial intelligence in neuroscience and psychology represents a new level of transformation in mental health care and neurological research. In this review, it has been shown that the application of AI in diagnostic processes may progressively contribute to improved diagnostic performance, early detection, and individualized treatment approaches. New

Table 1. Comparative Summary of AI-Related Studies in Neuroscience, Psychology, and Healthcare

Study Reference	AI Model/Research Focus	Key Contributions	Applications	Limitations/Challenges
[6]	Neuroimaging in mental health	Highlighted the role of functional MRI in supporting diagnosis and personalized medicine for mental disorders.	Supports early diagnosis, treatment planning, and patient-centered neurological and psychiatric care.	Requires further clinical validation, ethical control, and integration with routine healthcare practice.
[7]	Future-oriented neuroscience and psychology	Proposed an interdisciplinary model linking brain function, forecasting, psychology, philosophy, and artificial intelligence.	Useful for predictive research, future-oriented psychological studies, and understanding brain-based decision-making.	The model is theoretical and requires empirical validation using modern AI and neuroimaging datasets.
[8]	Neuroinformatics and AI	Explained how AI and data science can analyze large neuroimaging and electrophysiological datasets to reveal brain patterns.	Applicable to brain–computer interfaces, cognitive modeling, personalized healthcare, and neuromodulation.	Challenges include data complexity, interoperability, privacy, and the need for transparent AI algorithms.
[9]	Spinal cord injury rehabilitation	Reviewed biomedical, psychosocial, and technological directions for improving rehabilitation outcomes in spinal cord injury.	Supports rehabilitation planning, functional recovery, assistive technologies, and quality-of-life improvement.	Translation from research to clinical practice remains difficult due to cost, accessibility, and patient variability.
[10]	AI-assisted aneurysm diagnosis	Examined the use of AI with CTA, MRI, and DSA to improve intracranial aneurysm diagnosis.	Enhances diagnostic precision, medical imaging interpretation, and clinical decision support.	Requires high-quality imaging data, expert validation, and careful evaluation of diagnostic reliability.
[11]	Philosophical and technological AI	Discussed AI in relation to intelligence, creativity, consciousness, memory, learning, and language.	Provides a conceptual foundation for understanding AI's role in cognition and psychological theory.	Raises unresolved philosophical questions about machine intelligence, consciousness, and human uniqueness.
[12]	Artificial neural networks	Reviewed the development, characteristics, and multidisciplinary applications of artificial neural networks.	Applicable to medicine, psychology, economics, control systems, transportation, and information systems.	ANNs may suffer from interpretability problems, non-convex optimization issues, and dependence on training data quality.
[13]	AI in healthcare markets	Analyzed AI applications in healthcare across developed and emerging markets through comparative case studies.	Supports healthcare innovation, entrepreneurial decision-making, and AI tool selection in clinical industries.	Implementation is affected by infrastructure, regulation, cost, data availability, and market readiness.
[14]	Memory processes in dementia	Discussed memory changes in dementia and the diagnostic challenges associated with cognitive decline.	Supports AI-based memory assessment, dementia screening, and personalized cognitive intervention.	Memory processes remain complex, and AI systems require clinically representative datasets for accurate diagnosis.
[15]	Symbolic AI and adaptive systems	Critically examined traditional symbolic AI and its limitations in learning, vision, robotics, and motor functions.	Useful for understanding the shift from symbolic AI toward adaptive and connectionist approaches.	Traditional AI remains limited in handling complex real-world perception, learning, and movement-based tasks.
[16]	Anxiety and brain connectivity	Identified associations between insula–amygdala connectivity and state or trait anxiety using neuroimaging methods.	Provides potential biomarkers for anxiety diagnosis, monitoring, and targeted intervention.	Findings require larger samples, clinical replication, and integration with predictive AI models.
[17]	Traumatic brain injury needs assessment	Identified common self-reported problems among individuals with traumatic brain injury, including anxiety and money management.	Supports patient-centered rehabilitation, clinical prioritization, and mental health support for TBI survivors.	Open-text survey responses may be subjective and require systematic interpretation and broader validation.
[18]	In situ data management	Outlined priority research directions for managing diverse scientific data sources in real time.	Relevant to large-scale biomedical data analysis, simulations, sensor systems, and AI-driven discovery.	Requires advanced infrastructure, software coordination, transparency, and scalable data-management methods.
[19]	Neurological and psychiatric patent trends	Provided a bibliometric analysis of patents related to prevention and treatment technologies for neurological and psychiatric diseases.	Guides innovation mapping, technology development, and strategic planning in neurological and psychiatric healthcare.	Patent analysis may not fully reflect clinical effectiveness, real-world adoption, or patient outcomes.
[20]	Neuroethics and public engagement	Highlighted the importance of neuroethics education and public engagement for neuroscience students and researchers.	Promotes responsible AI and neuroscience practice, ethical awareness, and societal communication.	Implementation depends on institutional support, curriculum design, and sustained researcher engagement.

technologies, including neuroimaging, machine learning, and neuroinformatics, are being used to reveal more information about the brain and its functioning. Such developments are redesigning conventional healthcare systems and supporting modern patient-centered and multiprofessional investigation.

As expected, the use of AI systems in these fields comes with many ethical and pragmatic issues. A significant area of interest relates to data control, fairness in algorithmic use, and the proper functioning of artificial intelligence systems, all of which highlight the need to develop clear standards. These frameworks must establish how AI technologies can be applied safely without causing harm to patients' health, while also advancing the medical field. Furthermore, the requirement of accountability in AI use and the growing demand for system transparency mean that developers, practitioners, and policymakers must involve the public alongside technologists and clinicians.

Multidisciplinary cooperation is a central feature of practical artificial intelligence implementation in neuroscience and psychology. Cognitive, computational, bioethical, and medical expertise supports a multifaceted approach that confronts, rather than merely manages, severe psychiatric and neurological disorders. Such cooperation can also assist in closing the gap between technology and its adoption, ensuring that AI technologies are implemented for the public good in an efficient, sustainable, and credible manner.

With its vast potential, AI offers a promising future for the development of neuroscience and psychological sciences. It provides a new source of accurate diagnostic, therapeutic, and research approaches. However, the integration and application of AI are not without challenges, whether ethical, pragmatic, or interdisciplinary. By creating a cross-disciplinary focus and placing patient engagement at the center of research and practice, researchers and practitioners can harness the power of AI for mental health treatment and neurological disorders. In conclusion, this review presents several implications for future research, emphasizing the importance of a patient-centered approach as the field continues to progress.

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