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Intellectual Structure and Research Hotspots of AI-Based Mental Health Studies: A Bibliometric Analysis

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ABSTRACT

In recent years, instances of stress,anxiety, depression,suicide, and social isolation have been gradually rising, making psychological problem and mental health disorders a major global fear. The shortage of psychologist and mental health professionals has further heightened the need for innovative technological and useful solutions for society. In this context, Artificial Intelligence (AI) has demonstrated significant and important potential as a means to enhance mental health solution. The main objective of this research study was to examine the thematic organization and research trends within AI-based mental health research studies using bibliometrics analysis. On March 15, 2026, bibliographic records were retrieved from PubMed by searching for the term Artificial Intelligence-Based Mental Health. A total of 3,780 research papers were included in this final analysis. A software named, VOS viewer was utilized for bibliometric mapping and keyword co-occurrence analysis. The results of the research study revealed that deeply intertwined with major mental health issuessuch as stress, anxiety, depression, and schizophreniaalso with technical domains like machine learning, deep learning, neural networks, and natural language processing. The report of the research is also highlighted the accelerating integration of AI with digital health data, electronic health records, and neuroimaging techniques. Overall, this study demonstrates that Artificial Intelligence is emerging as a crucial multidisciplinary tool for enhancing research related to mental health, diagnosis, and treatment.

1. INTRODUCTION:

Globally, psychological problem and mental health issues have surged in recent decades, accompanied by a rise in suicide rates, substance addiction, and social isolation. During the COVID-19 pandemic, these trends became even more pronounced, placing an immense burden on mental health professionals. Concurrently, there is a severe shortage of experts in the field of mental healthcare; an estimated 4.5 million mental health workersincluding numerous psychiatristsare needed worldwide (Lee et al., 2021). Stress, anxiety and depression constitute the two primary causes of mental health issues globally. According to the Diagnostic and Statistical Manual of Mental Disorders, extreme worry and fear are indicators of anxiety, while persistent sadness and a lack of interest in daily activities are signs of depression (Zhong et al., 2024). The expression of symptoms, coordination efforts, and patient-clinician dialogue all rely heavily on spoken and written language, thereby making language an absolutely critical component of mental healthcare (Dehbozorgi et al., 2025).A wide range of computational techniques intended to replicate human cognitive capacities are collectively referred to as artificial intelligence (AI). Learning, reasoning, problem-solving, pattern identification, and forecasting are some of these (D, Alfonso, 2020). The diagnosis, treatment, and management of mental diseases are undergoing substantial changes as a result of the incorporation of AI into mental healthcare. The several uses of AI in the field of mental health are examined in this review, which highlights both its potential advantages and the difficulties in putting it into practice (Dehbozorgi et al., 2025). The current era represents a critical phase of the Fourth Industrial Revolution, sometimes known as the Digital Revolution and marked by the confluence of many cutting-edge technologies. Artificial intelligence is among this transformation's most important accomplishments. AI was first proposed in 1956 and is currently widely used in many different industries (Graham et al., 2019).AI is being used more and more in nursing and midwifery to improve patient care and help clinical decision-making. However, more awareness, access to digital health data, and specialised professional training are required for its successful deployment (Dehbozorgi et al., 2025).By offering conversational support, AI has the potential to improve mental health services and patient care. However, there are still worries about an excessive dependence on this technology, including problems with plagiarism and a possible deterioration in critical thinking abilities (Tam et al., 2023). Artificial intelligence has become a dependable instrument for enhancing mental health services and streamlining the delivery of healthcare. The use of AI technology is spreading quickly across many medical specialities, and new opportunities for study and innovation in the field of mental health care are presented by the growing availability of huge digital datasets like Electronic Health Records (Bi et al., 2019).The

clinical value of research on Embodied Artificial Intelligence in the context of mental health services is growing. The increasing therapeutic significance of AI in this field is highlighted by innovative applications like virtual therapists and social robots created for diseases like autism and dementia (Fiske et al., 2019). By helping physicians collect accurate patient progress data, streamlining workflow, and automating repetitive administrative activities, AI systems can improve behavioral health care (Sadeh-Sharvit et al., 2023). There has been an increasing interest in using Large Language Models to help address these issues within the mental health care sector as a result of the COVID-19 pandemic's increase in mental health needs, which has made the global shortage of mental health professionals worse (Wang et al., 2025).

When paired with professional knowledge, bibliometric analysis is a valuable technique for analyzing research trends, publishing patterns, top authors, productive nations, and influential works (Ahmad et al., 2021). A quantitative method for assessing trends in scholarly research is bibliometric analysis. It offers academics and policymakers valuable insights by assisting in the identification of trends and advancements within a specific field (Scarr&Jagnoor, 2021). Reputable academic papers from a variety of fields, including the humanities, social sciences, arts, and scientific disciplines, are indexed by major multidisciplinary citation databases including Web of Science, PubMed, and Google Scholar (Kumar et al., 2025). A statistical method called bibliometrics uses mathematical methods to objectively evaluate research articles in a particular field or subject (Yu et al., 2020). Co-word analysis is a technique utilized to investigate connections between keywords in scholarly literature. Instruments like VOS viewer illustrates these connections via network maps, where keywords are displayed as nodes linked by connections (Hassan & Duarte, 2024).

2. Materials and Methods pertaining to research

Collection of Data: -Present researchwork utilized a specific method (bibliometric analysis) to analyse the scholarly literature concerning mental health studies focused on artificial intelligence. Bibliographic entries were obtained from data base named PubMed, an esteemed database for biomedical and health-related literature. The inquiry was performed on March 15, 2026, utilizing the term Artificial Intelligence-Based Mental Health.Consequently, a total of 3,780 entries were obtained from the database, encompassing all records accessible until the retrieval date.

Search Strategy: - The search plan aimed to encompass literature concerning the application of artificial intelligence in studies related to mental health. All research records obtained from the authentic databases were taken into account for analysis.

Data Preparation: -The extracted research records were exported in a format appropriate for bibliometric analysis. The objective of this research study was to examine the overall research landscapetherefore, the complete dataset of 3,780 research publications was preserved for analysis.

Data Analysis: -The current research study was carried out utilizing a specific software named, VOS viewer. This software was employed to build and display bibliometric networks using the acquired dataset. Analysis of keyword co-occurrence was conducted to determine Important and significant research themes in this area. The software created network visualization maps that clustered related keywords according to their frequency and the strength of their connections. These visualizations were used to grasp the conceptual framework of studies performed on Artificial Intelligence in the area of MH (Mental Health).

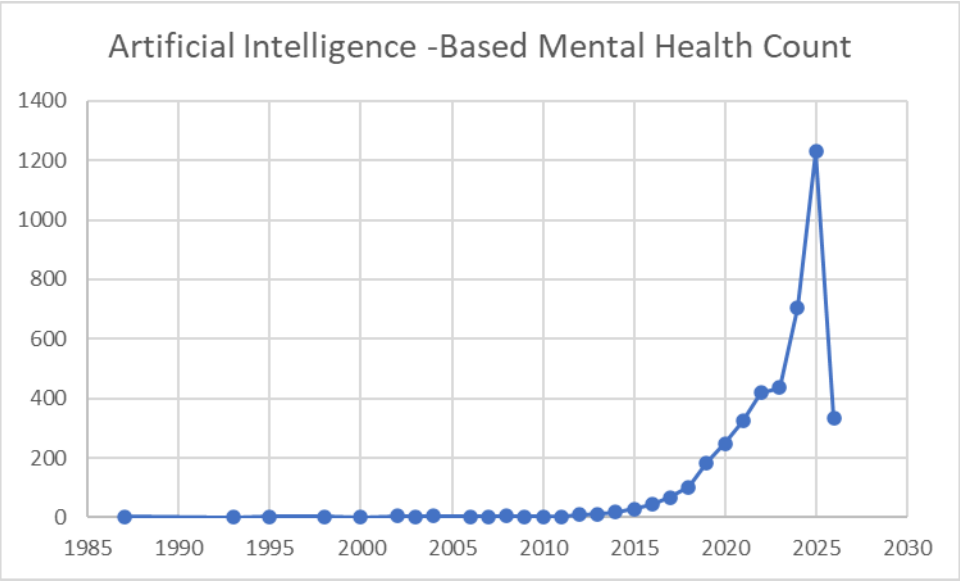


Figure:1 Distribution of publications on Artificial Intelligence-based mental healthresearch.

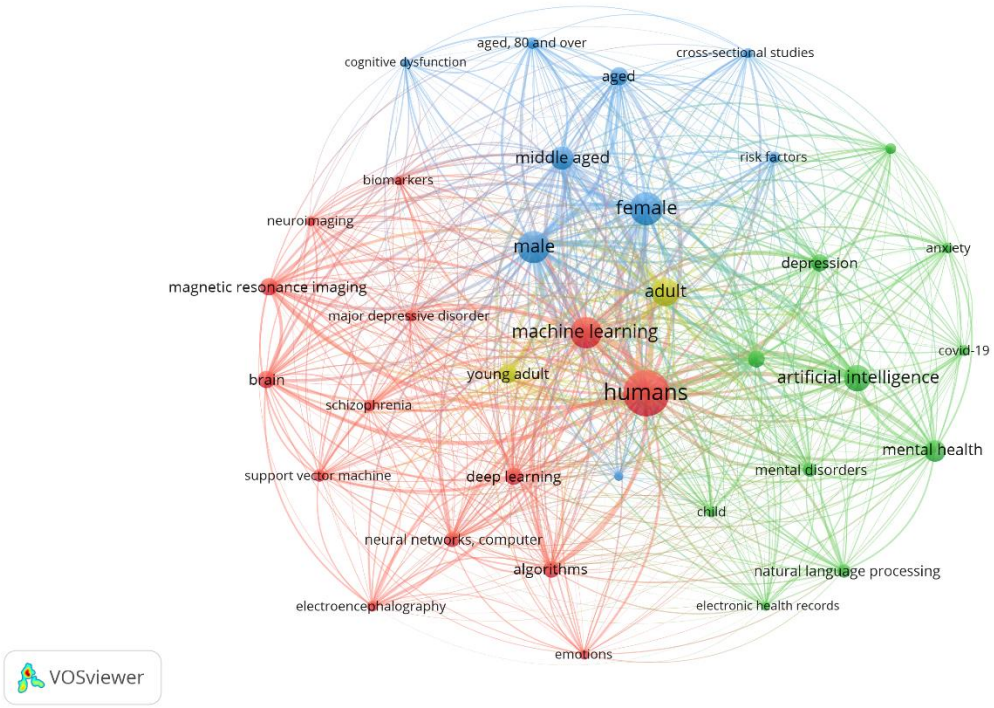
3. **Results**

Table -1: Co-occurrence of the keywords Related with Artificial Intelligence-based mental health research.

S. No.	Keywords	Occurance	Total Link Strength
1	Humans	2927	13931
2	Female	1502	10039
3	Male	1454	9864
4	Adult	1085	7595
5	Machine learning	1410	7267
6	Middle aged	756	5649
7	Young adult	529	4079
8	Artificial intelligence	988	3374
9	Aged	465	3250
10	Adolescent	400	2811
11	Magnetic resonance imaging	436	2803
12	Mental health	643	2683
13	Brain	432	2596
14	Depression	427	2368
15	Algorithms	380	2069
16	Deep learning	418	1936
17	Neural networks computer	331	1654
18	Mental disorders	281	1490
19	Support vector machine	214	1366
20	Aged 80 and over	184	1349
21	Risk factor	194	1254
22	Natural language processing	262	1145
23	Schizophrenia	185	1140
24	Survay and questionnair	165	1135
25	Major dipressive disorder	171	1067
26	Anxiety	176	1027
27	Child	174	1025
28	Electroencephalography	173	991
29	Cross-sectional studies	154	987

30	Neuroimaging	146	865
31	Biomarkers	144	849
32	Retrospective studies	124	828
33	Emotions	141	722
34	Cognitive disfunctions	120	714
35	Electronic health record	133	700
36	Covid-19	163	674
Total		17887	103296

Table 1 displays the outcomes of a keyword co-occurrence analysis concerning research on mental health utilizing artificial intelligence. The analysis of data shows that the keyword Humans has the highest frequency (2927) and the highest TLS Total Link Strength (13931), suggesting that most research work in this area concentrates on human populations. Demographic labels like Female, Male, Adult, Middle-aged, Young adult, Aged, and Adolescent are often present, highlighting the diverse population segments analyzed in the research work. The presence of terminology such as ML (Machine Learning), DL (Deep Learning), Algorithms, NN (Neural Networks), and SVM (Support Vector Machine) is important and significant, emphasizing the growing use of sophisticated computational methods related to mental health studies. The inclusion of different clinical and neurological terms like Depression, Anxiety, Schizophrenia, Mental disorders, Brain, and Biomarkers indicates that artificial intelligence is extensively utilized to explore significant psychiatric disorders and their foundational processes. The emergence of phrases associated with clinical instruments and data references like Magnetic resonance imaging, Electroencephalography, Neuroimaging, and electronic health records illustrates the fusion of AI with medical imaging and digital health information. Additionally, the appearance of COVID-19 within the keywords signifies an increasing research focus on the mental health impacts of the pandemic. Keyword network produced by a specific software named, VOS viewer highlights the interdisciplinary aspect of artificial intelligence-focused studies related to mental health, linking demographic, clinical, technical, and data-centric methods.



The figure: -2 Network visualization related to study on Artificial Intelligence-based mental health: A Network Analysis of Co-Occurring Keywords (Source: Generated by VOS viewer 1.6.19 software)

The figure displays a network of keywords utilized in research work on artificial intelligence within the areas of mental health. Each circle represents a specific keyword, while large circle like Human, Machine Learning, Artificial Intelligence and mental health highlights the areas that have been the subject of the most extensive research to data the lines connecting these circles illustrate how these keywords are interrelated across various studies.

4. Discussion of Findings

The research study on bibliometric analysis explored research patterns concerning artificial intelligence in mental health, using research works sourced from PubMed. Analysis of keywords indicated that demographic terms like humans, women, men, and adults were the most commonly utilized. This shows that most research centers on human populations spanning different age brackets and both the genders male and females. Terminology like machine learning, deep learning, algorithms, and neural networks was also significant, highlighting the growing application of computational techniques in analyzing data related to mental health. The use of these specific technique in psychiatric research is quickly growing to aid in diagnosis, prognosis, and treatment strategies (D'Alfonso, 2020; Bi et al., 2019). Clinical terms like depression, anxiety, and schizophrenia were also well represented. This indicates that research

involving AI often targets prevalent mental disorders that show a major role in the worldwide mental health burden (Zhong et al., 2024). Additionally, the inclusion of terms like magnetic resonance imaging, electroencephalography, and biomarkers suggests that numerous research studies combine artificial intelligence with data related to neuroimaging and physiologicalto improve the comprehension of brain-related mental conditions. The emergence of phrases such as electronic health records and natural language processing highlights the increasing significance of data related to digital health studies related to mental health. The addition of COVID-19 to the keywords indicates an increasing research focus on tackling the mental health issues that arose during thepandemic situation (Lee et al., 2021)

5. Conclusion

Utilizing the specific quantitative technique named bibliometric analysis, this research work investigates a thorough summary of advancements in research related to the use of Artificial Intelligence (AI) within the areas of mental health. An examination of articles sourced from PubMed emphasizes the swift expansion taking place in this research field, along with its progressively interdisciplinary characteristics. The findings show that technical methods like machine learning, deep learning, and neural networks are extensively employed to examine different mental health disorders, including depression, anxiety, and schizophrenia. The results of this research study also show a consistent rise in the utilization of digital health tools like neuroimaging data, electronic health records, and Natural Language Processing (NLP) methods in mental health research studies. These advancements indicate that Artificial Intelligence has considerable capacity to aid in the early identification, diagnosis, and treatment of mental health conditions. Present research study emphasizes that Artificial Intelligences role in influencing the future of Professional Psychologist and mental healthcare are becoming more vital. In other handthe research studies are needed to tackle ethical issues, concerns about data privacy, accountability and the ethical incorporation of AI technologies in clinical settings

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