

A Systematic Review on Artificial Intelligence in Psychological Assessment and Intervention

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ABSTRACT

Artificial intelligence (AI) is increasingly being integrated into psychological assessment and mental health care interventions, prompting growing interest in its clinical utility as well as its ethical implications. This narrative review draws on empirical studies published between 2010 and 2024 to examine how AI-based tools are currently being used in psychological practice and to identify the challenges associated with their implementation. Existing evidence indicates that AI-driven technologies, particularly chatbot-based interventions and machine learning models, show moderate effectiveness in identifying and managing symptoms of depression and anxiety. At the same time, their use raises important concerns, including algorithmic bias, data privacy risks, limited transparency, and the potential impact on the therapeutic relationship. Within the Indian context, where gaps in mental health service delivery remain substantial, AI-based tools may offer more scalable and accessible forms of care. However, their successful implementation depends on careful consideration of cultural and linguistic diversity. In response to these challenges, this paper proposes the Integrative Ethical–Clinical Framework for Responsible Artificial Intelligence in Psychology (IECFRAP), which emphasises ethical governance, cultural sensitivity, and sustained human oversight. Future research should prioritise longitudinal and culturally diverse investigations to strengthen the evidence base for AI-assisted mental health care.

Keywords: *Artificial Intelligence, Psychological Assessment, Digital Mental Health, Ethical AI, Cultural Bias, India*

Artificial Intelligence (AI) has emerged as one of the most transformative technological developments of the twenty-first century, with growing applications across healthcare systems worldwide. Broadly, AI refers to computational technologies capable of performing tasks that traditionally require human cognitive abilities, including learning from data, identifying patterns, making predictions, and supporting decision-making processes. In the field of mental health, AI-driven tools are increasingly being integrated into various aspects of psychological assessment and intervention, including diagnostic prediction, digital phenotyping, automated scoring of psychological measures, and technology-assisted psychotherapeutic support (Luxton, 2014; Torous et al., 2021).

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Received: June 17, 2026; Revision Received: July 26, 2026; Accepted: July 31, 2026

Recent advances in machine learning have demonstrated considerable potential for improving the identification and monitoring of mental health conditions. Studies have shown that algorithms can analyse linguistic patterns, behavioural indicators, social media activity, and electronic health records to detect symptoms of depression and identify individuals at elevated risk for suicide with promising levels of accuracy (Kessler et al., 2015; Miner et al., 2017). Such developments are particularly relevant in low- and middle-income countries where access to mental health services remains limited. In India, the substantial treatment gap, coupled with an insufficient number of trained mental health professionals, continues to pose a significant challenge to the delivery of timely and accessible psychological care (Gururaj et al., 2016). Within this context, AI-assisted technologies may offer opportunities to expand service reach, improve early identification of psychological distress, and support existing mental health infrastructures.

Despite these potential benefits, the integration of AI into mental healthcare raises important ethical, clinical, and sociocultural concerns. Questions regarding data privacy, informed consent, algorithmic bias, transparency of decision-making processes, and professional accountability have generated increasing scholarly debate (Fiske et al., 2019). Furthermore, concerns have been expressed about the extent to which AI-mediated interventions can replicate essential therapeutic elements such as empathy, trust, and the therapeutic alliance, which remain central to effective psychological practice. These challenges may be particularly significant in culturally diverse settings where contextual understanding and culturally responsive care are crucial components of mental health service delivery.

Recognising both the opportunities and limitations associated with AI-based mental health technologies, there is a growing need for frameworks that balance innovation with ethical responsibility. The World Health Organization (WHO, 2021) has emphasized the importance of ensuring that the development and deployment of AI systems are guided by principles of equity, transparency, safety, and human oversight. Accordingly, a critical examination of the current evidence base is necessary to inform responsible implementation and policy development.

Despite the rapid integration of artificial intelligence in various sectors, its application in psychological assessment and intervention remains underexplored in many developing contexts. In countries such as India, where access to mental health services is limited, AI-based tools may offer innovative solutions for screening, monitoring, and intervention. However, ethical, cultural, and professional concerns must be carefully examined. Therefore, a comprehensive review of the literature is necessary to understand both the opportunities and challenges associated with the use of artificial intelligence in psychological practice.

The present study contributes to the literature by synthesizing research on the applications of artificial intelligence in psychological assessment and intervention. By examining both technological advancements and ethical considerations, this study provides a comprehensive overview of the evolving role of AI in mental health care. Furthermore, the study highlights the importance of culturally sensitive implementation of artificial intelligence technologies, particularly in diverse contexts such as India. Given the significant treatment gap in mental health services across the country, AI-assisted tools may offer scalable solutions to improve accessibility and early identification of psychological distress (Gururaj et al., 2016; World Health Organization, 2022).

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The primary aim of the study is to examine the role of artificial intelligence in psychological assessment and mental health interventions while addressing associated ethical, clinical, and cultural considerations. Each research objective is aligned with a corresponding proposition to provide a structured analytical framework guiding the review. In addition, the study proposes an Integrative Ethical–Clinical Framework for Responsible Artificial Intelligence in Psychology (IECFRAP) provides a conceptual model that can guide future research, policy development, and clinical practice in the responsible adoption of AI technologies within mental health systems. To fulfill this aim five objectives were formulated for the present study as follows-

- To review the literature on the application of artificial intelligence in psychological assessment.
- To examine the use of artificial intelligence–based technologies in mental health interventions, including chatbot-based therapy and digital mental health platforms.
- To identify the ethical, clinical, and cultural challenges associated with the use of artificial intelligence in psychology.
- To explore the implications of artificial intelligence–driven mental health technologies for psychological services, with particular reference to the Indian mental health system.
- To develop an integrative conceptual framework for the responsible implementation of artificial intelligence in psychological assessment and mental health interventions.

In order to systematically reviewing the literature for these objectives the researchers of the present study had explored various reputable academic databases like PubMed, PsycINFO, Scopus, and Google Scholar etc. The selected studies encompass a wide range of research designs, methodological approaches, and application areas, enabling a comprehensive synthesis of the current developments, challenges, and potential of artificial intelligence in mental health assessment, intervention, and monitoring. To structure and guide the review process, the following research questions were formulated:

- RQ1. What are the major applications of artificial intelligence in psychological assessment?
- RQ2. How are artificial intelligence–based technologies being utilized in mental health interventions, particularly through chatbot-based therapy and digital mental health platforms?
- RQ3. What ethical, clinical, and cultural challenges are associated with the integration of artificial intelligence into psychological assessment and mental health interventions?
- RQ4. What are the potential implications of artificial intelligence–driven mental health technologies for psychological service delivery in the Indian mental health system?
- RQ5. What key principles and components should be incorporated into an integrative conceptual framework for the responsible implementation of artificial intelligence in psychological assessment and mental health interventions?

These research questions are proposed to examine the complex role of AI in psychological assessment, intervention and overall mental health care. RQ1, RQ2 and RQ3 explores the major applications of AI in psychological assessment as well as the use of AI-driven technologies integrated with mental health interventions such as chatbot-based therapy and digital platforms, and the ethical, clinical, and cultural challenges associated with their

implementation. RQ4 further investigates the potential implications of AI-based mental health technologies for service delivery within the Indian mental health system. Finally, RQ5 intended to identify the key principles and components necessary for developing an integrative framework for the responsible use of AI in psychodiagnostics and psychotherapeutic practices.

METHODS

This section of the study deals with the systematic design of the review process, identification and classification of relevant studies so that all the research questions are well addressed.

Review Protocol

This study follows a four-step review protocol: i) formulation of research questions, ii) establishment of inclusion/exclusion criteria, iii) defining the search process, and iv) extraction and synthesis of data. Figure 1 illustrates this entire workflow. While the research questions are introduced in Section 1, the subsequent three steps are detailed below.

Inclusion and Exclusion Criteria

A number of inclusion and exclusion criteria were applied while performing the screening process. The following criteria were used to ensure a rigorous and focused selection process:

- **Temporal Scope:** Only articles published between 2010-2024 were included. This threshold ensures that the review covers the time of introduction of modern ML/DL based models for psychodiagnostics and psychotherapeutic procedures.
- **Database Selection:** The search was restricted to five major databases, namely, PubMed, PsycINFO, Scopus, ScienceDirect, PubMed, and Springer. To maintain bibliographic control, publications from other sources were excluded.
- **Domain Relevance:** Studies included in this review should have a direct relationship between AI and mental health specifically use of AI in diagnostic and treatment procedures of mental health disorders. Studies of purely psychological nature without AI applications, as well as theoretical AI or individual algorithm developments without context in practical mental health, were excluded.
- **Language Barriers:** Publications only in English were accepted due to translation limitations.
- **Socio-Clinical and Ethical Scope:** Addressed clinical, ethical, or cultural aspects of AI in mental health.

Search Strategy

A structured keyword search was conducted using combinations of terms such as “*artificial intelligence*,” “*machine learning*,” “*digital mental health*,” “*psychological assessment*” and “*AI therapy*,” Boolean operators were used to refine search results and improve relevance. Relevant literature was identified through searches of established academic databases, including PubMed, PsycINFO, Scopus, and Google Scholar.

Extraction of data

The study selection process followed a systematic and structured screening approach. Initially, relevant records were identified through comprehensive database searches and reference list screening. Duplicate entries were subsequently removed, after which the titles and abstracts of the remaining studies were screened for relevance. Studies that met the preliminary screening criteria underwent a full-text assessment to determine their eligibility.

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Finally, studies were included in the review based on predefined inclusion and exclusion criteria. Through this rigorous selection process, a total of 35 studies were retained and included in the final review. The search strategy and data extraction process is depicted in figure 1.

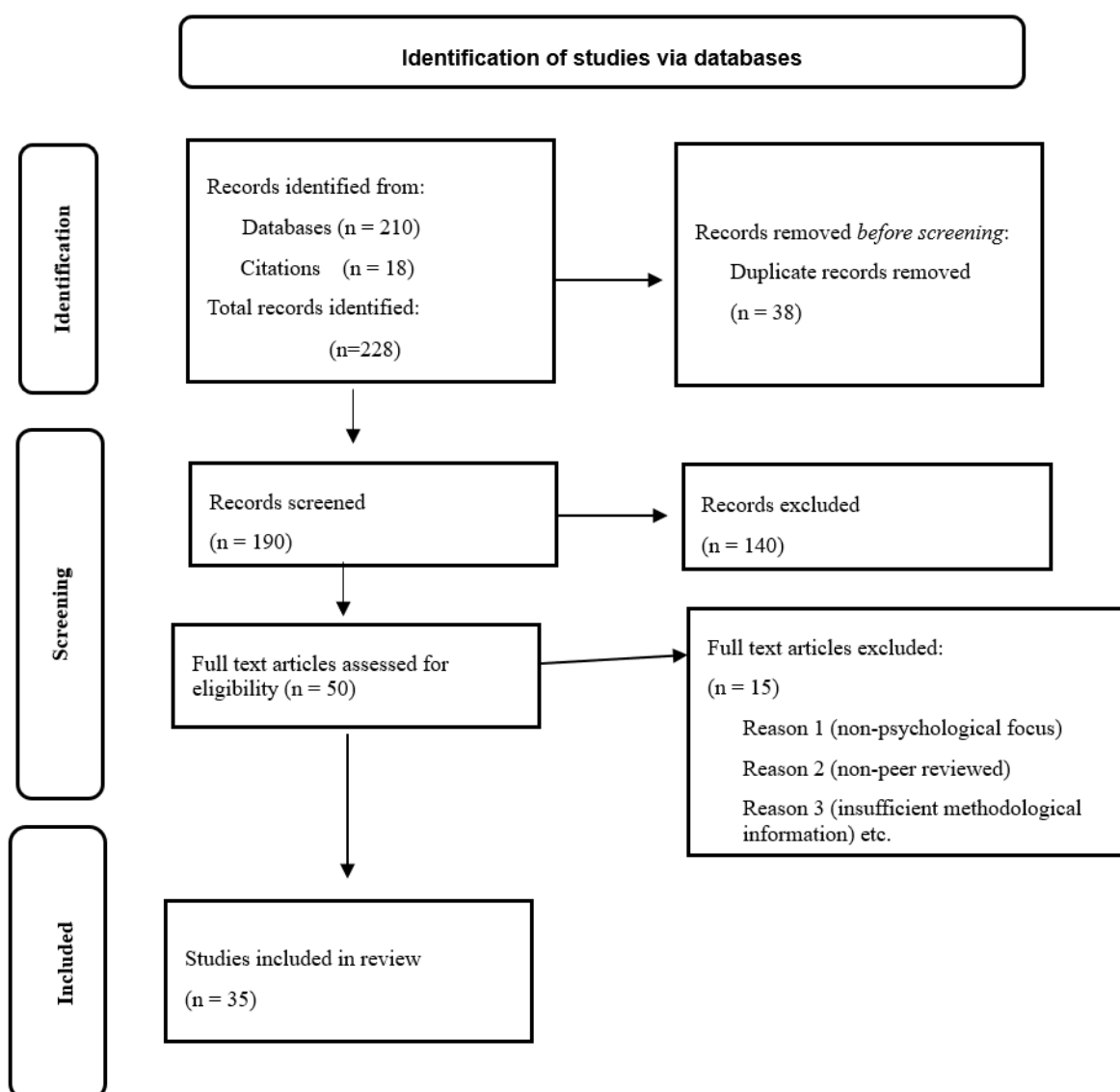


Figure 1: Search Strategy and Data extraction

By using a rigorous multi-stage extraction method, the present review filtered for only the most relevant, high-quality research. Researchers then organized and analyzed these findings to appropriately answer the research questions.

RESULT AND DISCUSSION

Artificial Intelligence in Psychological Assessment

In recent times, the idea of integrating artificial intelligence into psychological assessment has attracted a number of researchers from the field of psychology and machine learning (ML). This is largely due to the ability of AI driven algorithms to process large and complex datasets in relatively shorter time duration and with greater accuracy (Shatte et al., 2019; Torous et al., 2020). Unlike traditional assessment approaches, which often rely on structured instruments and clinician interpretation, AI-based systems can identify patterns

across multiple data sources, including behavioural indicators, linguistic features, movement features and digital activity (Bzdok & Meyer-Lindenberg, 2018).

One notable development that has been seen in this regard is the use of natural language processing to analyse communication patterns. Research studies in this domain suggested that variations in tone, word choice, and syntactic structure of the sentence may provide useful indicators of psychological states such as depression and anxiety (Calvo et al., 2017). By examining both written texts and spoken language, AI systems are capable of capturing minute but well-defined markers of distress that may not always be evident through conventional assessment methods (Miner et al., 2016).

Another dimension which has added a separate direction to the field of AI in mental health is the use of predictive analytics. ML models trained on large datasets generated from electronic health records (EHR) or behavioural data have demonstrated potential in identifying the vulnerabilities of developing clinically significant mental health conditions (Obermeyer et al., 2019; Shatte et al., 2019). Integration of ML models into the conventional diagnostic procedure has revolutionized the health care system. It has markedly reduced the time required for diagnosis and thereby speeding up the treatment initiation which may lead to better prognosis over time. Also, these approaches offer the possibility of earlier detection and intervention in cases where symptoms may not yet be clinically apparent. In table 1, relevant studies are depicted related to use of AI in psychological assessment

At the same time, using AI predominantly for diagnostic assessment raises concern as it may lack the human touch. Clinical decision making primarily depends upon the objective test results and the subjective observations. Human behavior is complex in nature and depending only upon the patterns for detection of abnormality may yield false positive results. Moreover, concerns have also been raised regarding the interpretability of algorithmic outputs, especially in systems that operate as so-called “black boxes” (Floridi et al., 2018). In clinical settings, where decisions carry significant consequences, the lack of transparency can limit trust and complicate the integration of such tools into practice (Fiske et al., 2019). As a result, while AI-based assessment offers clear advantages in terms of scale and efficiency, its role is best understood as complementary to, rather than a replacement for, clinical judgment (Topol, 2019)

Artificial Intelligence–Based Mental Health Interventions

Beyond assessment, artificial intelligence is increasingly being used to support the delivery of mental health interventions (Torous et al., 2020). Among the most widely discussed applications are chatbot-based systems and digital therapeutic platforms, many of which are designed to deliver structured approaches such as cognitive behavioural therapy (Fitzpatrick et al., 2017; Inkster et al., 2018). Evidence in this area suggests that such tools can contribute to modest improvements in symptoms of depression and anxiety, particularly when used as adjuncts to traditional care (Firth et al., 2017; Torous et al., 2020). Their accessibility and ease of use make them especially relevant for individuals who may face barriers to accessing in-person services, including stigma, geographical constraints, or limited availability of trained professionals (Patel et al., 2018).

At the same time, these technologies differ in important ways from conventional therapeutic approaches. While AI-based systems can provide structured guidance and immediate responses, they are limited in their ability to replicate the depth of human interaction (Fiske et al., 2019). Elements such as empathy, contextual understanding, and relational nuance—

central to effective psychotherapy—remain difficult to reproduce in automated systems (Miner et al., 2016).

For this reason, many researchers have emphasised the value of hybrid approaches, where AI tools are used to extend and support, rather than replace, clinical care (Topol, 2019). In such models, digital platforms may assist with monitoring, psychoeducation, or skill reinforcement, while clinicians continue to provide personalised and relationally grounded intervention (Torous & Roberts, 2017).

Ethical and Professional Concerns

As the use of AI in psychological practice expands, ethical considerations have become increasingly central to the discussion (Floridi et al., 2018; Fiske et al., 2019). Among the most prominent concerns is the issue of data privacy. AI systems typically rely on large volumes of sensitive personal information, and inadequate safeguards may expose users to risks related to data misuse or unauthorised access (Mittelstadt et al., 2016).

Algorithmic bias represents another significant challenge. Because AI models are trained on existing datasets, they may reflect and reproduce underlying biases present within those data (Obermeyer et al., 2019). In the context of mental health, this raises the possibility of inaccurate or unequal outcomes, particularly for individuals from underrepresented groups (Buolamwini & Gebru, 2018).

Questions of accountability also remain unresolved. When AI systems contribute to clinical decisions, it can be difficult to determine where responsibility lies in cases of error or harm (Floridi et al., 2018). This complexity highlights the need for clear regulatory frameworks and ongoing oversight to ensure that ethical standards are maintained.

More broadly, the integration of AI into psychological practice calls for careful consideration of professional roles. Rather than displacing clinicians, these technologies are more appropriately positioned as tools that support clinical reasoning (Topol, 2019). Maintaining this balance is essential for ensuring that technological innovation does not come at the expense of ethical responsibility or quality of care (Fiske et al., 2019).

Cultural Considerations and Bias

Cultural context plays a critical role in shaping how mental health is experienced, expressed, and interpreted (Kirmayer & Pedersen, 2014). However, many AI systems have been developed using datasets derived primarily from Western populations, particularly those from North America and Europe (Buolamwini & Gebru, 2018). This raises concerns about their applicability in culturally diverse settings, where patterns of emotional expression and help-seeking behaviour may differ significantly.

In contexts such as India, linguistic diversity adds another layer of complexity. Expressions of distress may vary not only across cultures but also across languages, and systems trained on limited datasets may misinterpret these variations (Patel et al., 2018). As a result, there is a risk that AI-based assessments may produce inaccurate or culturally insensitive outcomes.

Addressing these challenges requires more than technical adjustment. It involves the development of culturally responsive models that are informed by local contexts and lived experiences (Kirmayer & Pedersen, 2014). Incorporating diverse datasets, engaging with

community perspectives, and adapting tools to reflect cultural nuances are all important steps in this direction (World Health Organization, 2022).

AI and the future of mental health care

The growing demand for mental health services worldwide has intensified interest in digital and scalable solutions (World Health Organization, 2022). Reports continue to highlight substantial gaps in service provision, particularly in low- and middle-income countries (Patel et al., 2018). Within this landscape, AI-driven technologies are increasingly viewed as potential tools for expanding access to care (Torous et al., 2020). In settings where resources are limited, digital platforms may support screening, monitoring, and early intervention. When integrated with existing healthcare systems, such tools have the potential to extend services to populations that might otherwise remain underserved (Naslund et al., 2017).

At the same time, the successful implementation of these technologies depends on more than availability. Factors such as cultural relevance, user trust, and ethical governance play a crucial role in determining whether AI-based interventions are adopted and sustained in practice (Floridi et al., 2018).

Taken together, the literature suggests that while AI holds considerable promise for the future of mental health care, its impact will depend on how effectively it is integrated within broader clinical and social contexts. Approaches that prioritise flexibility, inclusivity, and ethical responsibility are likely to be the most sustainable in the long term (Topol, 2019).

Table No. 1: Synthesis of studies related to use of AI in psychological assessment and intervention

Author(s)	Year	Study type	AI application	Key Findings	Limitations
Fitzpatrick, et al.	2017	Experimental	Chatbot-based CBT	Reduced symptoms of depression and anxiety	Limited emotional depth and therapeutic alliance
Fulmer, et al.	2018	Experimental	AI mental health support system	Improved psychological well-being	Small sample size
Karyotaki, et al.	2021	Meta-analysis	Internet-based CBT	Effective in treating depression	High dropout rates
Obermeyer, et al.	2019	Observational	Predictive healthcare algorithms	Identified racial bias in AI systems	Dataset bias
Inkster, et al.	2018	Applied study	Conversational AI agent	Improved engagement and accessibility	Limited clinical validation
Torous, et al.	2021	Review	Digital psychiatry	Scalable mental health solutions	Privacy concerns
Shatte, et al.	2019	Review	Machine learning in	Effective	Lack of transparency

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Author(s)	Year	Study type	AI application	Key Findings	Limitations
			mental health	predictive analytics	
Graham, et al.	2019	Review	AI in psychiatry	Broad applications across disorders	Ethical concerns
Insel, T. R.	2018	Conceptual	Digital phenotyping	Enables continuous behavioural monitoring	Privacy and consent issues
Bickman, L.	2020	Conceptual	AI-assisted clinical decision support	Improves efficiency in mental health services	over-reliance risk
Luxton, D. D.	2014	Review	AI in psychological practice	Enhances assessment and intervention	Ethical concerns
Topol,	2019	Conceptual	AI in healthcare systems	Supports precision medicine	“Black box” issue
Jobin, A. et al.	2019	Review	AI ethics frameworks	Highlights need for global governance	Lack of enforcement
Arora, S. et al.	2022	Review	Digital mental health in LMICs	Useful in low-resource settings	Cultural limitations
Vaidyam, A. N. et al.	2019	Review	Mental health chatbots	Improves accessibility	Limited clinical depth

The thematic synthesis presented in Table 1 reveals three dominant trends in the application of artificial intelligence in psychological practice. First, there is increasing reliance on AI-driven predictive analytics and machine learning models for the early detection and diagnosis of mental health conditions. Second, AI-based interventions, particularly chatbot-driven cognitive behavioral therapy, demonstrate moderate effectiveness in reducing symptoms of depression and anxiety while improving accessibility to care. Third, a consistent emphasis across studies highlights ethical concerns, including algorithmic bias, data privacy, and lack of transparency. While experimental and meta-analytic studies support the clinical potential of AI technologies, review and conceptual studies underscore the need for culturally sensitive and ethically governed frameworks. These findings reinforce the importance of integrative approaches such as the proposed IECFRAP model for the responsible implementation of artificial intelligence in psychology (Floridi et al., 2018; Jobin et al., 2019).

Conceptual framework

The growing integration of artificial intelligence into psychological practice calls for frameworks that move beyond general ethical principles and engage more directly with clinical realities. While existing models of ethical AI emphasise concepts such as fairness,

transparency, and accountability, they often remain broad and may not fully capture the relational and contextual nature of psychological care.

In response to this limitation, the present study proposes the Integrative Ethical–Clinical Framework for Responsible Artificial Intelligence in Psychology (IECFRAP). Rather than treating technological, ethical, and cultural considerations as separate domains, the framework brings them into a more cohesive structure, reflecting the complexity of real-world practice.

IECFRAP is grounded in three intersecting perspectives: clinical psychology, which emphasises individualised care and therapeutic relationships; AI ethics, which focuses on responsible design and governance; and cultural psychology, which highlights the influence of sociocultural context on mental health experiences. By drawing on these domains, the framework aims to provide a more context-sensitive approach to the integration of AI in psychological systems.

Core Principles of the IECFRAP Framework

The framework is organised around five interrelated principles:

- **Human Oversight:** AI systems are best understood as decision-support tools rather than autonomous agents. Clinical responsibility remains with trained professionals, ensuring that AI-generated outputs are interpreted within appropriate psychological and contextual frameworks.
- **Transparency:** For AI tools to be meaningfully integrated into practice, their processes must be interpretable. This includes clarity around how data are used, how outputs are generated, and what limitations may be present within the system.
- **Cultural Calibration:** AI systems must be responsive to cultural and linguistic diversity. This involves the use of contextually relevant datasets and sensitivity to variations in how psychological distress is expressed across different populations.
- **Data Ethics Governance:** Given the sensitive nature of psychological data, strong safeguards are essential. Ethical implementation requires clear standards for consent, data protection, and responsible use.
- **Therapeutic Primacy:** The therapeutic relationship remains central to psychological care. AI tools should enhance—not replace—the relational aspects of therapy, supporting engagement without undermining trust or empathy.

Application of IECFRAP Across AI Domains

The value of the IECFRAP framework becomes more apparent when considered in relation to specific applications of AI in psychology. In psychological assessment, AI-based tools can enhance efficiency and scalability by analysing large datasets. However, without human oversight and interpretability, their outputs may be difficult to integrate into clinical decision-making. The framework therefore emphasises the importance of maintaining clinician involvement and ensuring transparency.

In the context of diagnostic prediction, machine learning models have demonstrated strong predictive capabilities. At the same time, concerns related to dataset bias and limited representativeness highlight the need for cultural calibration and ongoing monitoring.

Digital phenotyping—where data are passively collected through devices such as smartphones—offers opportunities for continuous monitoring of psychological states.

However, this approach raises significant concerns related to privacy and consent, underscoring the importance of data ethics governance.

Similarly, AI-based interventions such as chatbots and digital therapy platforms align closely with the principle of therapeutic primacy. While they may improve accessibility, their limitations in replicating human empathy reinforce the need for hybrid models that combine technological efficiency with human expertise.

Taken together, these applications illustrate how IECFRAP can function as a practical guide for aligning technological innovation with ethical and clinical priorities. The proposed IECFRAP model is illustrated in Figure 2.

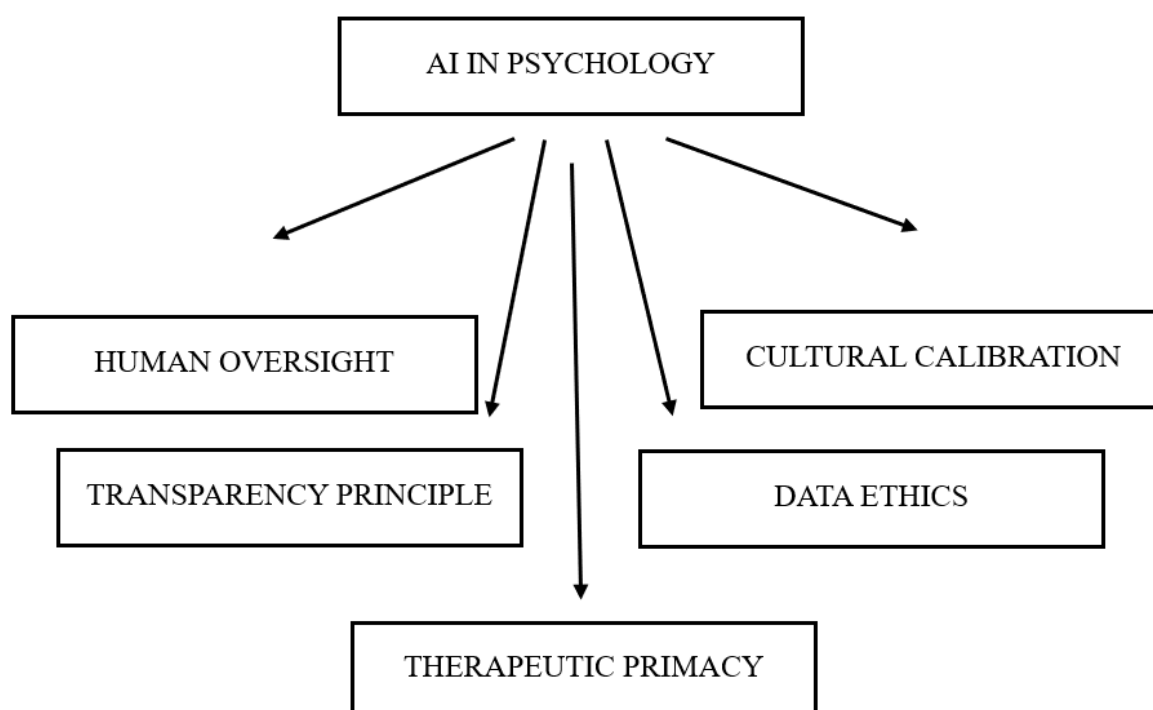


Figure 2: Integrative Ethical-Clinical Framework for Responsible Artificial Intelligence in Psychology (IECFRAP).

CONCLUSION

Artificial intelligence has the potential to transform psychological assessment and intervention by improving accessibility, efficiency, and early detection of mental health concerns. However, responsible implementation requires careful consideration of ethical standards, cultural diversity, and professional oversight. By integrating technological innovation with psychological expertise, AI can contribute significantly to the advancement of mental health care in both clinical and community settings. However, ethical governance, cultural sensitivity, and human oversight are essential to prevent harm. The IECFRAP framework advances the discourse on digital mental health by offering a theoretically grounded and practically applicable framework for responsible AI integration in psychology. It also contributes to the existing literature by offering a novel integrative approach that bridges technological innovation with ethical and culturally responsive psychological practice. Future empirical research should evaluate long-term outcomes of hybrid human-AI therapeutic systems (Torous et al., 2021).

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Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Gogoi, D., Das, P.R. & Begum, J. (2026). A Systematic Review on Artificial Intelligence in Psychological Assessment and Intervention. *International Journal of Indian Psychology*, 14(3), 681-694. DIP:18.01.057.20261403, DOI:10.25215/1403.057