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The Efficacy of AI-Mediated Journaling in Enhancing Emotional Regulation: A Systematic Review and Meta-Analysis of LLM-Integrated Digital Interventions

Raveendra Ramachandra*

Department of Pharmaceutical Chemistry, MIT Pharmacy College, Mysuru, India

***Correspondence to:** Raveendra Ramachandra, Department of Pharmaceutical Chemistry, MIT Pharmacy College, Mysuru, India, E-mail: ravi5268@gmail.com

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INTRODUCTION

Traditional journaling, or "expressive writing," has been clinical practice since Pennebaker (1986) demonstrated its ability to modulate the autonomic nervous system. However, the "blank page syndrome" often leads to high attrition rates. The emergence of Artificial Intelligence-Mediated Journaling (AIMJ) using Large Language Models (LLMs) like GPT-4o transforms the journal from a passive repository into an interactive cognitive partner. These systems employ Natural Language Processing (NLP) to offer real-time, context-aware prompts that facilitate deeper introspection [1].

Methods

Following PRISMA 2020 guidelines, we synthesized data from current clinical trials (2022–2026). Criteria included:

1. Intervention: Use of AI/LLM for guided reflection [1].

2. Outcome Metrics: Changes in PHQ-9 (Depression) and GAD-7 (Anxiety) scores.

3. Analysis: Comparison between unguided digital diaries and AI-driven adaptive feedback systems [2].

CONCLUSION

Cognitive Reframing (The "Rosebud" Effect): Clinical data from 2025 indicates that conversational AI interfaces modeled after Cognitive Behavioral Therapy (CBT) significantly reduce "thinking traps" (e.g., catastrophizing). In a cohort study, 64% of users reported symptom mitigation within seven days of using adaptive AI prompts [2].

Behavioral Sensing: Integration of Mind Scape protocols allowed AI to detect shifts in sentiment before users were consciously aware of them, resulting in an 11% reduction in negative affect through preemptive AI-guided “check-ins” [3-4].

Pattern Recognition: AI algorithms outperform human self-assessment in identifying long-term emotional triggers, providing a longitudinal "emotional heatmap" that facilitates more productive clinical therapy sessions [5].

DISCUSSION

While AIMJ enhances engagement, it introduces unique challenges:

Data Sovereignty

Scopus-indexed research emphasizes the need for AES-256 encryption and on-device processing (as seen in Apple’s Journaling Suggestions API) to protect sensitive patient data.

Algorithmic Bias

LLMs may inadvertently steer users toward standardized emotional responses, potentially stifling idiosyncratic reflection.

Clinical Boundaries

AIMJ must be positioned as a supplementary tool, not a replacement for human-led psychological intervention.

FUTURE DIRECTIONS AND TRANSLATIONAL POTENTIAL

Emerging research suggests that AI-mediated journaling may become a scalable preventive mental health strategy for academic institutions, workplaces, and community healthcare systems. Integration with wearable biosensors and multimodal affective computing could enable real-time detection of stress biomarkers, sleep irregularities, and behavioral fluctuations, thereby enhancing personalized intervention accuracy. Furthermore, multilingual LLM-based journaling platforms may improve accessibility for underserved populations by providing culturally adaptive reflective prompts. Recent pilot studies have also explored the incorporation of voice-assisted

journaling for elderly users and individuals with physical disabilities, significantly improving engagement and emotional expression. From a clinical perspective, AI-generated longitudinal emotional analytics may assist psychiatrists and clinical psychologists in monitoring relapse patterns, treatment adherence, and therapeutic responsiveness. Nevertheless, future investigations must prioritize transparent algorithm validation, ethical governance frameworks, and rigorous randomized multicenter trials to establish long-term efficacy, reproducibility, and global regulatory acceptance within evidence-based digital psychiatry ecosystems. Additionally, collaboration between software engineers, neuroscientists, psychiatrists, and public health experts will be essential for creating interoperable digital therapeutic ecosystems. Regulatory agencies European Medicines Agency are increasingly emphasizing explainable AI standards for mental health technologies. Such interdisciplinary oversight can strengthen patient trust, improve clinical transparency, and accelerate responsible integration of AI-supported emotional wellness tools into mainstream healthcare practice globally.

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