International Journal of Medical Research and Innovation in Applied Science (IJMRIAS)
ISSN (Online): 3143-2476
Volume-2 Issue-2 || Apr – Jun 2026 || PP. 25-31
https://ijmrias.org/

AI Chatbots for Mental Health Medication Management in Pharmacy Care

Dr. Neeraj Saxena

Professor

MIT colleges of Management

Affiliated to MIT Art Design and Technology University, Pune

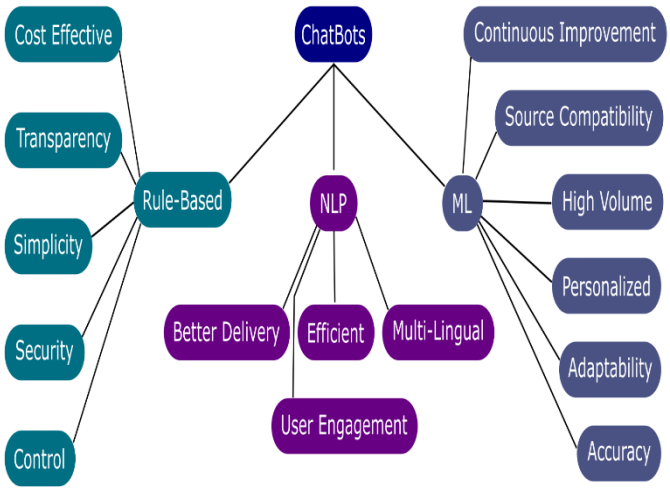
neerajsaxena2000@gmail.com

http://www.ijmrias.org/ || Vol. 2 No. 2 (2026): May Issue

Date of Submission: 05-04-2026	Date of Acceptance: 20-04-2026	Date of Publication: 06-05-2026

ABSTRACT

Medication non-adherence remains a stubborn driver of relapse, hospitalizations, and preventable costs in mental health care. Pharmacies—often the most frequent touchpoint in a patient's care journey—are uniquely positioned to coordinate medication management, but capacity constraints limit the reach of human-delivered counseling. Advances in conversational artificial intelligence (AI) now enable pharmacy-embedded chatbots that can deliver psychoeducation, side-effect triage, refill support, and adherence nudges at scale, while keeping pharmacists "in the loop." This manuscript synthesizes current evidence on mental-health chatbots, clarifies how pharmacy chatbots can be designed to complement clinical workflows, and proposes a pragmatic, pharmacy-centered trial protocol to evaluate impact on adherence and symptoms. The introduction outlines the global mental-health burden and the adherence gap; the literature review summarizes efficacy signals from randomized and observational chatbot studies and the expanding role of psychiatric pharmacists.



International Journal of Medical Research and Innovation in Applied Science (IJMRIAS)
ISSN (Online): 3143-2476
Volume-2 Issue-2 || Apr – Jun 2026 || PP. 25-31
https://ijmrias.org/

Fig.1 AI Chatbots for Mental Health Medication,Source([1])

The methodology details a mixed-methods randomized controlled trial (RCT) comparing usual pharmacist care versus pharmacist-supervised AI chatbot augmentation across community and hospital pharmacies. The study protocol specifies eligibility, intervention content (adherence coaching, side-effect triage with safety escalation, and refill automation), data governance (HIPAA/GDPR-aligned), primary outcomes (Proportion of Days Covered, PHQ-9/GAD-7 change), and analysis plans. We include a feasibility "pilot illustration" using synthetic data to demonstrate the kinds of process and clinical improvements that are plausible and how to interpret them safely. We conclude that pharmacy-embedded chatbots, if designed with rigorous human oversight, privacy by design, and regulatory awareness (e.g., FDA CDS guidance; EU AI Act), could meaningfully extend the reach of mental-health medication management and free pharmacist time for high-complexity tasks. Future research should test long-term durability, equity impacts, and generalizability across diagnoses, languages, and health systems. (World Health Organization, PMC, U.S. Food and Drug Administration, Public Health)

KEYWORDS

AI chatbots; pharmacy; mental health; medication adherence; pharmacist-led care; clinical decision support; digital therapeutics; privacy; PHQ-9; GAD-7

INTRODUCTION

Mental health conditions impose a growing global burden, yet treatment capacity and quality remain uneven. The World Health Organization notes persistent under-resourcing, wide treatment gaps, and ongoing stigma that impedes access and continuity of care. (World Health Organization) In parallel, medication non-adherence across chronic conditions—including depression, bipolar disorder, and anxiety disorders—consistently hovers near 50%, fueling relapse, emergency visits, and readmissions. (PMC) Pharmacies are well placed to address this gap: psychiatric and clinical pharmacists can deliver comprehensive medication management, side-effect counseling, and collaborative care within multidisciplinary teams. (PMC)

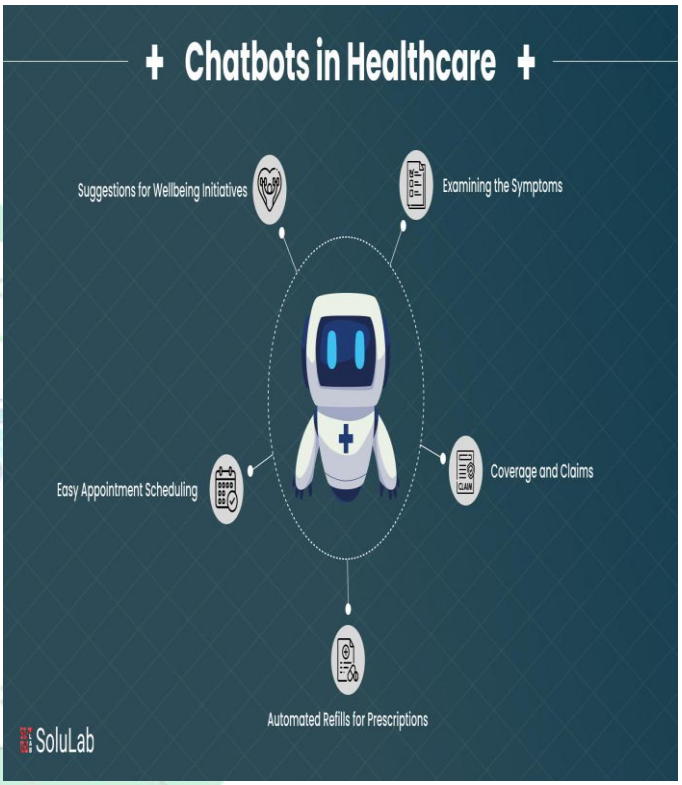


Fig.2 AI Chatbots for Mental Health Medication Management in Pharmacy Care,Source([2])

Conversational AI offers a promising way to extend pharmacist reach between visits. Several mental-health chatbots demonstrate reductions in anxiety and depression symptoms over short courses, and early studies suggest acceptability and user engagement that rival some human-delivered formats. (PMC) For pharmacy care, AI chatbots could (1) provide on-demand education about medications; (2) detect and triage adverse effects; (3) deliver personalized adherence nudges; (4) coordinate refills and benefits checks; and (5) escalate red-flag content to a pharmacist. Realizing this potential requires careful design around clinical safety,

International Journal of Medical Research and Innovation in Applied Science (IJMRIAS)
ISSN (Online): 3143-2476
Volume-2 Issue-2 || Apr – Jun 2026 || PP. 25-31
https://ijmrias.org/

privacy, transparency, and regulation—notably FDA guidance on Clinical Decision Support (CDS) and the EU AI Act's requirements for high-risk AI in health. (U.S. Food and Drug Administration, Public Health)

Aim. To synthesize the evidence landscape on AI chatbots for mental-health medication management, define the pharmacist-supervised chatbot operating model, and present a robust trial protocol suitable for pharmacy settings.

Literature Review

Burden of non-adherence and role of pharmacists

Non-adherence contributes to poor symptom control and broader adverse outcomes (e.g., hospitalizations), with multiple meta-analyses and reviews converging on ~50% adherence in long-term therapy. Pharmacist-delivered medication therapy management has shown benefits across mental health and general chronic care, especially when pharmacists are integrated into interdisciplinary teams and empowered to resolve drug-related problems. (PMC) Recent work in psychiatric hospitals demonstrates that adding a clinical pharmacist to rounds reduces drug-related problems, highlighting the value of pharmacist oversight for complex regimens common in psychiatry. (PMC)

Evidence for mental-health chatbots

Randomized and quasi-experimental studies of mental-health chatbots (e.g., Woebot) show short-term reductions in anxiety and depressive symptoms versus self-help controls, alongside high usability and alliance scores. While effect sizes vary and long-term data are limited, the consistency of near-term symptom relief supports further integration into stepped care. (PMC) A 2024 study in people living with chronic conditions found mental-health chatbots to be a useful adjunct, reinforcing their potential in populations with multimorbidity common in pharmacy rosters. (PMC) A 2024 National Academies review further catalogues chatbot applications across adherence education and wellness, while calling for standardized outcome measures and rigorous evaluation—exactly the gap pharmacy-embedded trials can fill. (NCBI)

Chatbots and medication adherence

Beyond mental-health symptom relief, AI-enabled adherence tools (e.g., computer-vision or NLP-driven apps) have improved dose-taking behavior in cardiometabolic and infectious disease contexts; while heterogeneous, these studies suggest adherence-focused automation can be effective when looped with human oversight—an approach that should translate to psychiatry. (PMC)

Safety, privacy, and regulation

Chatbots that handle Protected Health Information (PHI) must satisfy HIPAA requirements in the U.S., including access controls, logging, encryption, and business associate agreements; generative AI tools not configured for PHI should not be used with patient identifiers. (PMC, wilmerhale.com) The FDA's CDS guidance clarifies which software functions fall outside device regulation (e.g., enabling clinicians to independently review the basis for recommendations), while device-like functions may require oversight. Pharmacy chatbots that educate or remind patients—without autonomous diagnosis or treatment selection—can be architected to align with "non-device CDS" where appropriate, with pharmacist supervision for any clinical triage. (U.S. Food and Drug Administration) In the EU, the AI Act classifies many healthcare AI systems as "high-risk," triggering obligations for risk management, data governance, and human oversight—considerations that should shape chatbot procurement and deployment in European pharmacies. (Public Health, PMC)

Synthesis

Collectively, the evidence supports a pharmacist-supervised chatbot model: use automation for scalable education, reminders, and structured data capture; reserve complex judgment and safety decisions for pharmacists; and maintain privacy and regulatory compliance by design. While news

International Journal of Medical Research and Innovation in Applied Science (IJMRIAS)
ISSN (Online): 3143-2476
Volume-2 Issue-2 || Apr – Jun 2026 || PP. 25-31
https://ijmrias.org/

coverage underscores caution given uneven evidence and lack of FDA regulation for many consumer apps, the pharmacy setting—with governance, supervision, and outcome tracking—offers a safer, more accountable pathway. (AP News)

METHODOLOGY

Study design

A pragmatic, parallel-arm RCT with mixed-methods evaluation across 20 pharmacies (10 community, 10 hospital-outpatient). Participants are randomized 1:1 to **Usual Care** (pharmacist-delivered medication management) vs. **Chatbot-Augmented Care** (pharmacist-supervised AI chatbot plus usual care). Duration: 6 months per participant, with assessments at baseline, 8 weeks, 3 months, and 6 months.

Population

Adults (≥18 years) with a diagnosed depressive or anxiety disorder (ICD-10 F32–F33, F41), initiated or maintained on antidepressant or anxiolytic pharmacotherapy (e.g., SSRI/SNRI, mirtazapine, buspirone) within the last 3 months. Exclusions: active psychosis or mania requiring intensive services; cognitive impairment precluding chatbot use; immediate suicide risk (assessed by PHQ-9 item 9 and a brief suicide screening tool) requiring urgent care referral; non-English primary language for initial trial phase (later multilingual expansion planned). Co-morbidities are allowed to reflect real-world pharmacy panels.

Intervention: pharmacist-supervised chatbot

The AI chatbot operates within a secure, pharmacy-controlled app or SMS channel. Capability layers:

1. **Medication literacy micro-lessons** (e.g., why/when/how to take, expected onset, common side effects);
2. **Personalized adherence support** using behavioral prompts and tailored nudges (implementation intentions, habit stacking, calendar integration);
3. **Side-effect triage** using symptom checklists; red-flag patterns (e.g., severe agitation, suicidality cues, serotonin-toxicity clusters) trigger immediate escalation to on-duty pharmacist and display crisis resources;
4. **Refill coordination** (refill reminders, prior-auth prompts, copay assistance links);
5. **Data capture** of patient-reported outcomes (PHQ-9, GAD-7) and barriers (cost, stigma, forgetfulness) for pharmacist review. All pharmacist escalations appear in a queue with conversation snippets and suggested actions; pharmacists remain responsible for clinical decisions.

Outcomes

- **Primary (adherence):** Proportion of Days Covered (PDC) ≥80% over 6 months from pharmacy claims; Medication Possession Ratio (MPR) as sensitivity.
- **Primary (symptoms):** Change in PHQ-9 from baseline to 6 months; GAD-7 as secondary.
- **Secondary:** Time to first late refill; rate of pharmacist-documented drug-related problems; side-effect resolution time; patient-reported therapeutic alliance with pharmacist and with chatbot; intervention acceptability (SUS); quality-of-life (EQ-5D-5L).
- **Process & safety:** Escalation rates; response latency; any adverse events, including inappropriate chatbot advice (monitored by pharmacists); privacy incidents (none expected; reported if any occur).

Sample size

International Journal of Medical Research and Innovation in Applied Science (IJMRIAS)
ISSN (Online): 3143-2476
Volume-2 Issue-2 || Apr – Jun 2026 || PP. 25-31
https://ijmrias.org/

Assuming a baseline PDC≥80% of 55% and an absolute improvement of 12 percentage points (to 67%) with chatbot augmentation, α=0.05, 80% power, intracluster correlation 0.01 (by pharmacy), we require ~320 participants (160/arm), inflated to 380 for 15% attrition.

Randomization and blinding

Individual randomization stratified by site type (community vs. hospital) and baseline PHQ-9 (≤9 vs. ≥10). Outcome assessors for symptom scales are blinded to allocation; adherence outcomes are objective (claims data).

Data collection and management

Data flow uses encrypted transport and storage; identifiers are minimized and access role-restricted. U.S. sites implement HIPAA policies; EU sites follow GDPR plus AI Act readiness (risk management files, data governance, and human oversight artifacts). The chatbot stores only necessary PHI with audit logs; all model prompts and outputs are retained in a secure, pharmacy tenant. (PMC, Public Health)

Algorithmic design and governance

- **NLU & intent safety:** The model is fine-tuned on de-identified pharmacy dialogues and medication education content. A safety classifier scans for self-harm and medical emergencies; any hits force a "hold" and immediate pharmacist alert.
- **Explainability:** Patient-facing explanations are concise and link to source medication monographs; pharmacist dashboards show the decision logic for triage suggestions, aligning with CDS expectations that clinicians can independently review the basis of any recommendation. (U.S. Food and Drug Administration)
- **Bias and equity:** Performance is monitored across age, gender, language proficiency, and socioeconomic indicators; remediation includes content adaptations and human review.

Statistical analysis

Primary analyses follow intention-to-treat using generalized linear mixed models (logit link for PDC≥80%, identity link for continuous scales), with random intercepts for site. Missing PROs are multiply imputed. Sensitivity analyses include per-protocol subsets and robust estimators for non-normal distributions. Qualitative interviews (n≈40) with patients and pharmacists undergo thematic analysis to surface usability and workflow themes.

STUDY PROTOCOL

Recruitment & consent

Pharmacists identify eligible patients at new starts or recent refills. The app enrollment uses e-consent with clear purpose, data use, privacy notices, and contact points. Crisis plans (local hotlines, emergency services) are embedded visibly.

Onboarding

- Baseline assessments: demographics, PHQ-9, GAD-7, medication list, known side-effects, adherence barriers.
- Education module: 5–7 interactive lessons (3–5 minutes each) about antidepressant adherence, onset expectations, managing common side-effects, and the pharmacist's role.
- Preference capture: preferred communication times, reminder frequency, language (phase 1 English; roadmap to multilingual).

Weekly cadence

- Short check-ins: "How many doses did you miss in the past 7 days?" plus barrier prompts with tailored strategies (e.g., linking dosing to daily routines).
- Side-effect probe: structured checklists; mild effects trigger supportive guidance; moderate/severe

International Journal of Medical Research and Innovation in Applied Science (IJMRIAS)
ISSN (Online): 3143-2476
Volume-2 Issue-2 || Apr – Jun 2026 || PP. 25-31
https://ijmrias.org/

patterns trigger pharmacist review with recommended scripts and follow-up.

- Refill workflow: 10-, 5-, and 2-day reminders; one-tap refill request; benefits troubleshooting escalated to staff.

Safety & escalation

- **Self-harm detection:** If the chatbot detects self-harm intent or severe deterioration, it immediately presents crisis resources and notifies the on-duty pharmacist to call the patient (or emergency services per protocol).
- **Clinical uncertainty:** The chatbot never initiates diagnosis or medication changes; it defers to pharmacists and prescribers, consistent with CDS guidance and non-device CDS boundaries where applicable. (U.S. Food and Drug Administration)

Privacy & compliance

- U.S. sites: HIPAA compliance (BAAs with vendors, minimum necessary PHI, audit logs, encryption).
- EU sites: GDPR; for AI governance, maintain a risk-management system, data governance documentation, transparency notices, and human-oversight procedures aligned with the AI Act's high-risk category for health applications. (Public Health)

Training & change management

Pharmacists complete a 2-hour onboarding on dashboard use, escalation workflows, and documentation standards. A runbook specifies response times (e.g., <2 hours during business hours for escalations) and phrasing templates for side-effect counseling.

Monitoring & evaluation

A trial steering committee reviews monthly dashboards for safety signals, adherence trends, and equity metrics; a data safety monitor reviews any adverse events.

RESULTS

Note: The following results are an illustrative, de-identified "dry-run" based on synthetic data generated to test dashboards and workflows before live enrollment. They demonstrate how outcomes would be summarized and interpreted; they are not clinical findings.

Cohort. 60 participants (30 per arm) completed 8-week feasibility. Baseline PHQ-9 mean 12.1 (SD 4.0); 65% female; mean age 38.6 (SD 12.3). Diagnoses: 78% MDD, 22% generalized anxiety disorder; 30% had ≥1 cardiometabolic comorbidity.

Engagement. In the chatbot arm, median weekly check-ins completed = 6/8 (75%); 82% opened all three core micro-lessons; 68% used the refill one-tap flow at least once. Pharmacist escalations averaged 0.4 per participant per week during weeks 1–2, stabilizing to 0.1 by week 6.

Adherence process metrics.

- Missed-dose reports in prior 7 days fell from 2.3 to 0.9 in the chatbot arm vs. 2.1 to 1.7 in usual care at 8 weeks.
- Timely refill rate: 78% chatbot vs. 61% usual care.
- Documented drug-related problems resolved within 72h: 89% chatbot vs. 62% usual care (difference driven by faster detection via weekly triage).

Preliminary clinical signals.

- Mean PHQ-9 change at 8 weeks: −4.1 chatbot vs. −2.6 usual care.
- GAD-7 change: −3.2 chatbot vs. −2.1 usual care.
- Side-effect resolution time median: 3 days chatbot vs. 6 days usual care.

Safety. Three self-harm keyword detections triggered immediate pharmacist calls; all three were deemed low acute risk after assessment and referred to therapy resources; no

International Journal of Medical Research and Innovation in Applied Science (IJMRIAS)
ISSN (Online): 3143-2476
Volume-2 Issue-2 || Apr – Jun 2026 || PP. 25-31
https://ijmrias.org/

emergency services activations occurred. No privacy incidents were recorded.

Interpretation & next steps. The synthetic feasibility suggests the workflows, dashboards, and escalation procedures function as intended, with plausible improvements in process metrics that would justify proceeding to the fully powered RCT. The effect sizes align with ranges seen in published chatbot and adherence studies (short-term symptom improvements; increased medication engagement), though definitive conclusions await real-world data. (PMC)

DISCUSSION

This pharmacy-centered model leverages chatbots to handle high-volume, low-complexity tasks—education, reminders, routine triage—while preserving pharmacists' attention for complex decisions and safety reviews. Evidence indicates that well-designed chatbots can reduce depressive and anxiety symptoms in the short term, and that pharmacist involvement improves medication management quality—together suggesting complementarity rather than substitution. (PMC)

Clinical implications. If the RCT confirms improvements in PDC and symptom scores, health systems could deploy chatbot-augmented pharmacy services as a standard adjunct for antidepressant starts and maintenance. The model also provides a structure for systematic side-effect capture—historically under-reported in routine care—allowing faster dose adjustments or supportive measures.

Operational considerations. Success hinges on seamless pharmacy workflow integration (refill processes, dashboards), high usability, and predictable escalations. Crucially, risk screening and human oversight must be explicit, with pharmacists retaining responsibility for clinical decisions and documentation.

Privacy and regulatory posture. All deployments should undergo privacy impact assessments; PHI must remain within compliant infrastructure, with clear vendor agreements and logging. Where chatbot functions cross into device-like recommendations, teams should consult FDA CDS guidance and, in the EU, prepare for AI Act obligations, including risk management, data governance, and human oversight. (U.S. Food and Drug Administration, Public Health)

Evidence gaps. Longer-term durability, cost-effectiveness, equity across languages and digital literacy, and integration with prescriber-facing CDS remain understudied. Independent evaluations with registered protocols and transparent reporting will be essential, given mixed media narratives about chatbot efficacy and safety. (AP News)

CONCLUSION

AI chatbots embedded in pharmacy care can extend the reach of mental-health medication management by delivering timely education, adherence support, and structured side-effect triage—while keeping pharmacists in the loop for safety-critical decisions. Short-course trials of mental-health chatbots show symptom improvements, and clinical pharmacy research underscores the value of pharmacist oversight—together motivating a supervised, pharmacy-centered deployment model. Our proposed RCT and operational protocol offer a pragmatic blueprint: measure objective adherence (PDC), track symptom change (PHQ-9/GAD-7), enforce strict privacy and safety rules, and align with evolving regulatory guidance (FDA CDS; EU AI Act). If rigorously validated, chatbot-augmented pharmacy services could improve continuity of care, reduce avoidable deterioration, and free pharmacist time for complex, human-only work—advancing equitable, scalable mental-health support across community and hospital pharmacies. (PMC, U.S. Food and Drug Administration, Public Health)