

User Needs and Prototype Development of a Culturally Adapted Internet-Based Cognitive Behavioral Therapy for Depression in Thailand: A Qualitative Study

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Abstract

Background

Depression is one of the most disabling conditions worldwide, imposing a disproportionate burden in low- and middle-income countries where access to evidence-based treatment remains severely limited. In Thailand, structural and cultural barriers continue to restrict psychiatric care, particularly for individuals who decline pharmacotherapy. Internet-based cognitive behavioral therapy (iCBT) has demonstrated efficacy in treating mild-to-moderate depression across multiple randomised controlled trials and meta-analyses; however, culturally adapted iCBT systems for Thailand are virtually absent from the literature.

Objective

To systematically explore the psychosocial and functional needs of individuals with depression who decline pharmacological treatment and of certified CBT therapists regarding iCBT, and to use these needs to inform the user-centered prototype development of EmMind iCBT-Thai, a culturally adapted Thai digital mental health platform.

Methods

A qualitative study was conducted using semi-structured in-depth interviews with 16 purposively sampled participants: 8 adults with clinically assessed mild-to-moderate depression (Patient Health Questionnaire-9 [PHQ-9] score 5–19) who declined medication, and 8 CBT-credentialed therapists. Data were analysed using Braun and Clarke's six-phase reflexive thematic analysis. Sampling continued until theoretical saturation was reached. Trustworthiness was established through member checking, peer debriefing, and investigator triangulation, consistent with Lincoln and Guba's (1985) criteria. Reflexivity was maintained throughout via journaling and team discussion.

Results

Four themes emerged from the patient group: (T1) need for psychological safety and privacy, driven by fear of social stigma and data insecurity; (T2) need for accessible psychoeducation, encompassing diagnostic self-clarification and mechanistic understanding of depression; (T3) need for structured, 24/7 available skills training for in-vivo cognitive and emotional management; and (T4) need for evidence-grounded treatment decision guidance to reduce help-seeking delays. Three themes emerged from therapists: (T5) need for digital psychoeducation support tools to reduce repetitive in-session explanations; (T6) need for a structured homework assignment and between-session monitoring system; and (T7) need for collaborative in-session therapy tools with continuity across the therapeutic frame.

These seven themes directly informed the design of a five-module EmMind system architecture through a Design Thinking process.

Conclusions

This study provides the first systematic, user-centered evidence base for the design of a culturally adapted iCBT system in Thailand. The EmMind/JaiGu iCBT-Thai prototype operationalises both patient and therapist needs within a blended-care, privacy-first digital architecture. Future research should evaluate clinical efficacy and cost-effectiveness through a randomised controlled trial.

1. Introduction

1.1 Global and Thai Burden of Depression

Depression ranks among the leading causes of disability globally, affecting an estimated 280 million people and constituting the foremost contributor to years lived with disability (YLD) [1]. In Thailand, national survey data indicate that approximately 1.5 million adults experience clinically significant depressive symptoms, a figure that rose substantially during and following the COVID-19 pandemic [2, 3]. Despite this burden, the psychiatrist-to-population ratio stands at approximately 0.8 per 100,000 – nearly five times below the World Health Organization’s recommended benchmark of 4.15 per 100,000 [4]. The consequences of this structural imbalance include extended waiting times, geographic concentration of specialist services in major urban centres, and substantial unmet treatment need, particularly in rural and peri-urban communities.

Beyond workforce shortfalls, mental health stigma functions as a persistent and powerful barrier to help-seeking in Thailand. Epidemiological evidence indicates that stigma-related concerns substantially delay initial consultation and interrupt treatment engagement [3, 5]. Among those who do access psychiatric services, a meaningful proportion decline pharmacotherapy because of concerns regarding side effects, perceived dependency risk, and the additional stigma associated with psychotropic medication use [6]. Individuals in this subgroup represent a clinically distinct and underserved population for whom psychological intervention alternatives are both appropriate and urgently needed.

1.2 Cognitive Behavioral Therapy and the Case for iCBT

Cognitive behavioral therapy (CBT) commands the strongest empirical evidence base among psychotherapies for mild-to-moderate depression, demonstrating efficacy equivalent to antidepressant medication in direct head-to-head trials and meta-analyses [7, 8]. The core mechanisms of CBT – cognitive restructuring, behavioural activation, and skills-based coping – are theoretically well-specified and have been operationalised in manualised protocols amenable to digital delivery [9].

Internet-based CBT (iCBT) represents the most extensively researched modality within the digital mental health landscape. A landmark systematic review and meta-analysis by Etzelmüller et al. (2020),

encompassing 19 routine-care studies, reported a large pooled effect size for depression (Hedges' $g = 1.78$), with guided iCBT — in which a credentialed therapist provides asynchronous support — consistently outperforming unguided formats [10]. Andersson's (2024) updated narrative review confirmed that iCBT effects generalise to routine clinical care settings and extend across the lifespan, including adaptations for adolescents, older adults, and individuals affected by the COVID-19 pandemic [7]. Collectively, this body of evidence supports iCBT as a scalable, cost-effective, and clinically equivalent complement or alternative to face-to-face CBT.

1.3 Cultural Adaptation and the User-Centered Design Imperative

Despite the strength of the international evidence base, the preponderance of iCBT systems have been developed in English-speaking, high-income, Western settings — primarily Australia, Sweden, the Netherlands, the United Kingdom, and the United States [7, 10, 11]. Cross-cultural adaptation of such systems is not merely a linguistic translation exercise; it requires systematic reconfiguration of content, metaphor, help-seeking norms, therapeutic alliance expectations, and technological interface conventions to align with the target cultural context [12]. Failure to undertake this adaptation compromises both engagement and clinical effectiveness [13].

User-centered design (UCD) — a human factors methodology in which end-user perspectives are embedded at every stage of system development — has been identified as a critical determinant of iCBT acceptability and effectiveness [14, 15]. Qualitative studies of iCBT users consistently identify privacy protection, content personalisation, professional support, structured homework, and culturally resonant language as key determinants of engagement [11, 16, 17]. Despite this evidence, research applying UCD principles to iCBT development in the Thai context is absent from the peer-reviewed literature.

The present study therefore addressed two objectives: (1) to systematically explore the iCBT-related needs of individuals with depression who decline pharmacotherapy and of certified CBT therapists in Thailand, using an in-depth qualitative methodology; and (2) to use these evidence-grounded needs to inform the user-centered prototype development of EmMind iCBT-Thai.

2. Methods

2.1 Study Design

This study employed a qualitative research design within a user-centered design research framework, as recommended for the exploration of experiential, motivational, and contextual dimensions of digital health system requirements [18, 19]. Qualitative methodology was selected because the research questions necessitated the capture of meanings, interpretations, and lived experiences that are not amenable to quantification and that would be inadequately addressed through survey or observational approaches alone [20]. The research integrated Braun and Clarke's (2006) reflexive thematic analysis

with an iterative Design Thinking process (Empathise → Define → Ideate → Prototype → Test), ensuring that analytical findings directly and transparently informed prototype development decisions.

2.2 Participants and Sampling

Purposive sampling was employed to recruit participants with the specific characteristics and experiential knowledge required to address the research objectives [21]. Two groups were recruited. The patient group (n = 8) comprised adults aged 18 years or older who met the following inclusion criteria: (i) a clinical diagnosis of mild-to-moderate major depressive disorder or persistent depressive disorder, confirmed by a consulting psychiatrist and corroborated by a PHQ-9 score of 5–19; (ii) explicit preference to avoid or discontinue pharmacotherapy; (iii) functional internet access and literacy; and (iv) capacity for verbal communication in Thai. The therapist group (n = 8) comprised licensed mental health professionals with documented CBT competency, defined as completion of a recognised CBT training programme and at least two years of active CBT practice with individuals presenting with depressive disorders. Exclusion criteria for the patient group were: PHQ-9 score ≥ 20 (severe depression), active suicidal ideation (Columbia Suicide Severity Rating Scale [C-SSRS] score ≥ 3), co-occurring psychotic disorder or bipolar disorder type I, or inability to communicate effectively in Thai. Table 1 presents the demographic and professional characteristics of all participants.

Table 1
Demographic and Professional Characteristics of Participants (N = 16)

Characteristic	Patients (n = 8)	CBT Therapists (n = 8)	Total (n = 16)
Age range, years	18–24	28–52	18–52
Sex, female, n (%)	6 (75)	5 (63)	11 (69)
Depression severity (PHQ-9)	Mild (5–9): 5 Moderate (10–14): 3	—	—
Prior psychiatric consultation, n (%)	4 (50); all declined medication	—	—
Professional role, n (%)	—	Psychiatrists: 3 (38) Clinical psychologists: 3 (38) Social workers: 2 (25)	—
CBT experience, years (range)	—	2–15	—
Prior digital health tool use, n (%)	5 (63)	6 (75)	11 (69)

Note. PHQ-9 = Patient Health Questionnaire-9. CBT = Cognitive Behavioral Therapy. All identifying information has been removed. Mild depression: PHQ-9 5–9; moderate depression: PHQ-9 10–19.

2.3 Data Collection

Data were collected through individual semi-structured in-depth interviews conducted by the principal investigator between [Month] and [Month] [Year]. Each interview lasted between 45 and 90 minutes and was conducted in Thai in a private, confidential setting of the participant's choosing (including in-person clinic rooms and secure videoconferencing). A theoretically informed interview guide was developed specifically for this study and reviewed for content validity by a panel of three experts: one senior psychiatrist with qualitative research expertise, one clinical psychologist, and one specialist in digital health design. The guide was piloted with two individuals not enrolled in the study, and minor revisions were made to improve clarity and flow before formal data collection commenced.

For the patient group, the interview guide explored: (i) the lived experience of depression and its impact on daily functioning; (ii) prior and current treatment experiences; (iii) reasons for declining or discontinuing pharmacotherapy; (iv) perceived barriers to accessing conventional psychiatric services; (v) prior experiences with digital health applications; and (vi) expectations, preferences, and concerns regarding iCBT. For the therapist group, the guide addressed: (i) the clinical workflow and documentation burden of CBT practice; (ii) perceived limitations of current practice tools; (iii) requirements for digital psychoeducation support; (iv) needs regarding homework assignment and between-session monitoring; (v) attitudes toward technology integration in CBT; and (vi) feature priorities for a hypothetical iCBT system. All interviews were digitally audio-recorded with participants' informed written consent and transcribed verbatim in Thai by a trained research assistant. Transcripts were reviewed against the original recordings by the principal investigator to ensure accuracy.

2.4 Data Analysis

Thematic analysis was conducted following Braun and Clarke's (2006) six-phase reflexive framework, which was selected for its flexibility, rigour, and explicit acknowledgement of researcher subjectivity as an analytic resource rather than a confound [22]. The six phases were implemented as follows.

Phase 1 (Familiarisation): All interview transcripts were read and re-read in full by two members of the research team, who each independently generated written initial notes and observations. Audio recordings were re-listened for prosodic and affective dimensions not captured in transcription.

Phase 2 (Generating initial codes): Both analysts independently applied open coding to each transcript, generating descriptive and interpretive codes for every extract judged analytically relevant to the research questions. Initial code lists were compared and refined through a structured discussion process.

Phase 3 (Constructing themes): Codes were sorted into candidate themes by each analyst independently. Thematic maps were produced to visualise relations among codes and to identify potential higher-order themes and sub-themes.

Phase 4 (Reviewing themes): Candidate themes were systematically reviewed against the full dataset to assess coherence and distinctiveness. Themes not supported by a sufficiently rich range of data across

participants were collapsed or reorganised. Analyst thematic maps were compared and discrepancies resolved through discussion until consensus was achieved.

Phase 5 (Defining and naming themes): Each finalised theme was assigned a concise descriptive name and a formal definition specifying its boundaries and its relation to the research questions.

Phase 6 (Writing the report): Findings were written up with dense, illustrative participant quotations selected to represent the range of perspectives within each theme. Quotations were translated from Thai to English by a bilingual research team member with clinical psychology training, and verified by a second bilingual reviewer.

2.5 Determination of Theoretical Saturation

Data collection and analysis proceeded concurrently following established grounded methodology [21]. Theoretical saturation was defined as the point at which additional interviews generated no new codes, themes, or meaningful variations in the data patterns already identified. Following the 14th interview, no new codes were generated; the 15th and 16th interviews confirmed this observation, at which point data collection was formally concluded.

2.6 Trustworthiness

Trustworthiness was established through multiple complementary strategies aligned with Lincoln and Guba's (1985) four criteria. Credibility was addressed through member checking: a written summary of preliminary themes and representative quotations was shared with a purposively selected subset of five participants (three patients, two therapists), who were invited to verify that the interpretations accurately represented their experiences. Minor clarifications were incorporated in response to participant feedback. Confirmability was addressed through peer debriefing: the complete analytic process — including initial code lists, thematic maps, and draft theme definitions — was reviewed by an independent senior researcher with expertise in qualitative health research and no involvement in the study, who confirmed the logical coherence and interpretive transparency of the analysis. Investigator triangulation was achieved through the independent parallel coding and theme construction process described above. Source triangulation was inherent in the study design, which deliberately included two distinct stakeholder groups with different experiential vantage points on the same phenomenon. Transferability was supported by the provision of a thick contextual description of the research setting, sampling strategy, participant characteristics, and analytical process, enabling readers to make informed judgements about applicability to other contexts.

2.7 Reflexivity

The primary analyst is a practising psychiatrist with training and practice experience in CBT, which afforded interpretive sensitivity to clinical content but also introduced the risk of over-interpreting participant responses through a clinical lens. This risk was systematically managed through three mechanisms: (i) maintenance of a reflexive journal throughout data collection and analysis, in which preconceptions and evolving interpretive positions were documented and examined; (ii) structured

bracketing exercises prior to each analysis session, in which prior assumptions were explicitly acknowledged; and (iii) regular team discussions in which all analysts surfaced and challenged each other’s interpretive moves. These practices are consistent with best practice recommendations for reflexivity in clinical qualitative research [22].

2.8 Ethical Considerations

Ethical approval

was granted by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB Protocol No. [to be inserted upon approval]). All participants provided written informed consent prior to enrolment. Consent forms were written in plain Thai at a sixth-grade reading level. Participants were informed of their right to withdraw at any time without consequence for their clinical care. Audio recordings and transcripts were stored in password-protected, encrypted files accessible only to named research team members. All identifying information was removed prior to analysis and is absent from this report. In accordance with the Thai Personal Data Protection Act B.E. 2562 (PDPA), participant data were processed, stored, and reported in strict compliance with sensitive personal data requirements.

3. Results

3.1 Participant Characteristics

Sixteen participants were enrolled, comprising 8 individuals with depression and 8 CBT therapists. The patient group (n = 8) ranged in age from 18 to 24 years (mean 20.5 years), was predominantly female (n = 6, 75%), and included five participants with mild depression (PHQ-9 5–9) and three with moderate depression (PHQ-9 10–19). All had declined pharmacotherapy; four (50%) had previously consulted a psychiatrist. The therapist group (n = 8) included three psychiatrists, three clinical psychologists, and two social workers, with CBT experience ranging from 2 to 15 years. Table 1 presents full participant characteristics.

Across the two groups, seven themes were identified: four from the patient group (T1–T4) and three from the therapist group (T5–T7). Table 2 provides a structured summary of all themes, sub-themes, representative quotations, and corresponding EmMind design features.

Table 2

Summary of Themes, Sub-themes, Illustrative Quotations, and EmMind System Design Features

Theme	Theme Label	Sub-themes	Representative Quotation (excerpt)	EmMind Feature(s)
T1	Psychological Safety & Privacy	Anonymity need; Fear of data breach; Fear of social judgment	"I want someone to listen, but I'm afraid people who know me will think I'm weak." (P3)	Anonymous login; AES-256 encryption; PDPA-aligned privacy notice
T2	Psychoeducation	Diagnostic uncertainty; Need for mechanistic knowledge; Desire for reliable self-assessment	"I want to know whether what I'm feeling is really depression, or just a temporary mood state." (P1)	PHQ-9 screening; Thai-language video psychoeducation library; CBT model infographics
T3	Structured Skills Training	24/7 access requirement; Step-by-step guidance; Nocturnal distress episodes	"Sometimes I feel terrible in the middle of the night... If there were an app that guided me through breathing or writing down my thoughts, that would be incredible." (P6)	Interactive Thought Record; daily mood tracker; guided breathing & mindfulness modules
T4	Treatment Decision Guidance	Severity uncertainty; Help-seeking delay; Desire for non-pharmacological pathway	"I'd like to know whether I need to see a doctor, or whether I can manage on my own." (P4)	Symptom triage (PHQ-9 score-linked); step-up care guidance; specialist referral pathway
T5	Psychoeducation Support Tools	Repetitive in-session explanations; Need for Thai content; Session time efficiency	"Sometimes I explain the CBT triangle in every session. I'd love to have visuals that patients could review at home." (Th2)	Shareable psychoeducation modules; CBT triangle visualizer; difficulty-tiered content
T6	Structured Homework & Monitoring	Homework non-compliance; Pre-session data review; Automated reminders	"I'd like to see a patient's mood diary before the session so I can plan what to focus on." (Th7)	Homework assignment module; therapist dashboard with pre-session summary; push notifications

Note. P = patient participant. Th = therapist participant. Numbers denote participant identifiers. Quotations translated from Thai by a bilingual clinical psychologist and verified by a second bilingual reviewer.

Theme	Theme Label	Sub-themes	Representative Quotation (excerpt)	EmMind Feature(s)
T7	Collaborative Therapy Tools	Shared in-session workspace; Behavioral planning; Continuity across settings	"If we could complete a thought record together on the same screen... and the patient could continue at home, that would be ideal." (Th3)	Shared session workspace; behavioral activation planner; between-session task continuity
<i>Note. P = patient participant. Th = therapist participant. Numbers denote participant identifiers. Quotations translated from Thai by a bilingual clinical psychologist and verified by a second bilingual reviewer.</i>				

3.2 Patient Group Themes (T1–T4)

Theme 1 Need for Psychological Safety and Privacy

All eight patient participants identified the absence of a genuinely private, non-stigmatising space for emotional disclosure as a primary and pervasive barrier to mental health help-seeking. Participants articulated a consistent pattern in which the desire to discuss their experiences was systematically inhibited by fear of social judgement from acquaintances and family members, concern about inadvertent disclosure by mental health professionals, and deep uncertainty about the data security of existing digital applications. These concerns were not abstract; several participants described specific incidents in which concern about observation or disclosure had caused them to avoid or abandon a mental health resource.

"I want someone to listen, but I'm afraid people who know me will think I'm weak. If there was a place where nobody knew me at all, I think I could speak more freely." (P3)

"I worry about data leaks. I'm not confident about where the apps I currently use actually store my information – or who can access it." (P7)

The theme of privacy encompassed three analytically distinct sub-themes: (a) the desire for anonymous or pseudonymous engagement that decoupled mental health activity from social identity; (b) concern about the integrity of data storage and the risk of breach or third-party access; and (c) a desire for partial or selective disclosure – that is, the ability to engage authentically with a platform without exposing the full extent of their distress to any identifiable party. This finding is consistent with Borghouts et al.'s (2021) systematic review, which identified privacy as the most consistently reported facilitator of digital mental health engagement, and with Zamani et al.'s (2023) qualitative analysis, which documented anonymity as a structurally important factor in cultural contexts where mental health stigma is entrenched.

Theme 2 Need for Accessible Psychoeducation

Seven of eight patient participants reported a fundamental deficit in their understanding of their own condition, including its aetiology, neurobiological mechanisms, trajectory, and the evidence base for non-pharmacological management strategies. This knowledge deficit was not experienced as a neutral information gap; rather, participants described it as contributing directly to diagnostic uncertainty (and therefore to help-seeking delay), to self-blame and demoralisation, and to difficulty engaging meaningfully with treatment options.

"I want to know whether what I'm feeling is really depression, or just a temporary mood state. If I knew for certain, I think I'd find it easier to take it seriously and do something about it." (P1)

"I want to understand how the brain works when you're depressed – why I feel the way I do – and what I'm actually supposed to do about it. Right now it's just a fog." (P5)

Three analytically separable sub-themes were identified within this theme: (a) the need for structured self-assessment to resolve diagnostic uncertainty, which participants experienced as a prerequisite to help-seeking; (b) the need for mechanistic psychoeducation – specifically, an accessible account of the neurobiological and cognitive-behavioural processes underlying depression – to provide a sense of coherence and agency; and (c) the need for information sourced from credible, clinician-endorsed channels rather than from general internet searches, which participants described as unreliable and sometimes distressing. These findings align with prior evidence that psychoeducation constitutes a necessary condition for patient engagement with CBT, and that deficits in illness understanding predict lower treatment adherence [23].

Theme 3 Need for Structured, Around-the-Clock Skills Training

All eight patient participants expressed a strong and urgent desire for a platform that would enable structured, self-directed practice of cognitive and emotional regulation skills as part of their daily lives – and, critically, during moments of acute distress that fell outside scheduled appointment windows. The temporal dimension of this need was salient: several participants described experiences of severe nocturnal distress during which no human support resource was available, and during which the absence of a structured, accessible coping tool was experienced as acutely impairing.

"I want a place to practise managing negative thoughts, but I don't know where to begin. If there were step-by-step instructions – something that took me through the process – that would be really helpful." (P2)

"Sometimes I feel terrible in the middle of the night and there is nobody to help. If there were an app I could open that would guide me through a breathing exercise, or help me write down my thoughts and challenge them, that would make an enormous difference." (P6)

This theme encompassed three sub-themes: (a) the desire for 24/7 availability, which participants contrasted explicitly with the temporal constraints of both conventional outpatient appointments and telephone crisis lines; (b) the need for step-by-step structured guidance, rather than open-ended journaling or self-monitoring, reflecting participants' limited prior exposure to CBT techniques; and (c)

the need for practical in-vivo coping tools — specifically guided breathing, grounded mindfulness, and Socratic thought-recording exercises — that could be initiated and completed in a state of acute distress. These findings are consistent with those of Atik et al. (2022) and Lunkenheimer et al. (2021), both of whom identified 24/7 availability and structured skill-building as the highest-ranked patient priorities in iCBT development.

Theme 4 Need for Treatment Decision Guidance

Six of eight patient participants expressed clinically meaningful uncertainty about the nature and severity of their symptoms and, as a consequence, about whether professional consultation was necessary or proportionate. This uncertainty was not experienced as benign; rather, it constituted a specific, aversive cognitive state that functioned to delay help-seeking, producing what participants described as a paralysing waiting period in which they monitored their symptoms without acting on them.

“I’d like to know whether, at the level I’m at right now, I need to see a doctor, or whether I can manage on my own through some kind of self-help. The uncertainty about that is actually one of the hardest parts.” (P4)

“If I could input my symptoms and get a clear, evidence-based recommendation — not just a generic disclaimer — I think I’d feel a lot more confident about what to do next.” (P8)

The theme was structured around three sub-themes: (a) severity uncertainty — specifically, the inability to locate one’s current symptom profile within a clinically meaningful framework without professional consultation; (b) the identification of a structured triage or decision-support function within the platform as the most desired resolution of this uncertainty; and (c) the desire for graduated, non-pharmacological pathways — including self-help, guided iCBT, and referral to specialist care — to be presented as transparent, evidence-based options rather than binary decisions. This finding echoes Andersson’s (2024) recommendation that iCBT platforms incorporate a stepped-care triage architecture, and aligns with the broader literature on help-seeking delay in depression [6].

3.3 Therapist Group Themes (T5–T7)

Theme 5 Need for Digital Psychoeducation Support Tools

All eight therapist participants identified the delivery of psychoeducation as a clinically essential but disproportionately time-consuming component of CBT sessions, and reported that the absence of supplementary digital materials constrained the educational impact of the limited session time available. Therapists described a pattern in which foundational CBT concepts — particularly the cognitive model, the thought-feeling-behaviour relationship, and the rationale for behavioural activation — required repeated explanation across multiple sessions because patients had no durable reference material to consolidate their understanding between appointments.

“Sometimes I find myself explaining the CBT triangle in every single session — the first session, the third, the fifth — because there is nothing for the patient to take home and review. If I had an animated version

they could watch at their own pace, the session time could be spent on applying the model rather than re-explaining it.” (Th2)

“If there were high-quality video-based psychoeducation in Thai – genuinely well-produced, not just a recording of someone reading slides – that would be transformative. It would allow me to personalise each session much more.” (Th5)

Three sub-themes were identified: (a) the need for visual and multimedia psychoeducation materials – including animated explanations of the cognitive model and the neurobiological rationale for CBT – that patients could access and review independently between sessions; (b) the need for all materials to be available in high-quality Thai, reflecting the therapists’ assessment that existing Thai-language CBT resources were inadequate in both quantity and quality; and (c) the need for content to be calibrated to patient educational level, with varying levels of conceptual complexity available for different patient groups. These findings align closely with Atik et al. (2022) and Mol et al. (2020), both of whom identified psychoeducation support as the highest-priority feature requirement among therapists adopting blended CBT formats.

Theme 6 Need for Structured Homework and Between-Session Monitoring

All eight therapist participants described between-session homework as the single most clinically impactful component of effective CBT delivery, and simultaneously identified homework non-compliance as the most prevalent and consequential implementation challenge they encountered in practice. The absence of a digital system for homework assignment, automated reminding, and compliance monitoring was identified as a critical gap that resulted in lost therapeutic gains, reduced treatment efficiency, and the need to dedicate valuable in-session time to reconstructing what had occurred in the preceding week rather than advancing the treatment plan.

“The core problem is that patients forget to do their homework, or they forget to bring it, or they do it but don’t remember what they felt at the time. If there were an app with automated reminders and a visible, time-stamped record of what they’d done, it would fundamentally change the efficiency of the therapy.” (Th1)

“Ideally, I’d be able to see a patient’s mood diary in the hour before the session – to understand what they’ve been experiencing since we last met and to plan the session accordingly. Right now I’m walking in blind.” (Th7)

The theme comprised three sub-themes: (a) the need for a structured digital homework assignment interface that enabled therapists to assign specific CBT tasks – including thought records, behavioural activation schedules, and mood monitoring – in a standardised format; (b) the need for automated patient-facing reminders that reduced reliance on patient-initiated recall; and (c) the need for a pre-session patient summary that aggregated homework completion data, mood ratings, and significant events reported since the previous appointment, enabling evidence-based session planning. These

findings strongly parallel those of Kazantzis et al. (2010), who demonstrated that between-session homework completion is one of the strongest predictors of CBT outcome, and those of Atik et al. (2022), who ranked homework and monitoring systems as the highest-priority therapist requirements in a blended-CBT needs assessment.

Theme 7 Need for Collaborative In-Session Therapy Tools

Six of eight therapist participants identified the absence of a shared digital workspace for collaborative skill practice during sessions as a significant limitation on the quality and transferability of in-session therapeutic work. In the absence of such tools, therapists described relying on paper-based worksheets, improvised whiteboard exercises, or verbal dialogue alone – approaches that lacked the capacity for seamless continuity into between-session practice and that were perceived as less engaging for technologically literate younger patients.

“If there were an application where we could complete a Thought Record together on the same screen during the session – so that the patient sees exactly what I’m doing as I’m doing it – and then that record stayed accessible to them so they could continue working on it at home, that would be ideal.” (Th3)

“I need a system where I can plan a behavioural activation schedule with the patient in the room, assign specific activities with times and difficulty ratings, and then see whether they completed them and how they felt afterwards. That kind of continuity across the therapeutic frame is what makes the difference.” (Th8)

Three sub-themes were identified: (a) the need for a shared real-time collaborative workspace in which therapist and patient could co-construct CBT formulations, Thought Records, and behavioural experiments during live sessions; (b) the need for tasks initiated in-session to be automatically accessible to patients outside the session for continued self-directed practice; and (c) the need for a structured behavioural activation planning and monitoring function that tracked task completion and affective response over time. These requirements are consistent with theoretical accounts of the blended care model [24] and with the evidence that therapeutic alliance – operationalised in part through shared task engagement – is a significant predictor of iCBT outcome [25].

4. EmMind/JaiGu Prototype Development

4.1 From Qualitative Findings to Design Specifications

Following completion of thematic analysis, the research and software development teams convened a structured ideation workshop in which each of the seven themes was systematically translated into functional design specifications for the EmMind/JaiGu system. This process followed the Ideate phase of the Design Thinking framework, in which user insights are transformed into actionable design principles. The workshop employed affinity mapping to cluster related feature requirements, prioritised features on the basis of theme prevalence and clinical urgency, and produced a consensus feature specification document that served as the basis for the subsequent Prototype phase.

In parallel, a comparative analysis of existing English-language iCBT platforms – specifically MoodGYM (Australia), SilverCloud (Ireland/United Kingdom), elona therapy (Germany), and Space from Depression (United Kingdom) – was conducted to identify features with established usability evidence and to distinguish EmMind’s contextually specific design requirements from those already operationalised elsewhere. Table 3 presents the comparative feature analysis. This analysis confirmed that no existing platform addressed the Thai-language, privacy-first, medication-decliner, and therapist-collaborative requirements identified in the qualitative findings, establishing the distinctive design rationale for EmMind/JaiGu.

Table 3
Feature Comparison of EmMind iCBT-Thai with Selected International iCBT Platforms

Feature	MoodGYM (AU)	SilverCloud (IE/UK)	elona therapy (DE)	EmMind/JaiGu iCBT-Thai (TH)
Language	English	English	German	Thai (primary)
Cultural adaptation	No	No	Partial	Yes (user-grounded)
Therapist dashboard	No	Yes	Yes	Yes
Homework tracking	Partial	Yes	Yes	Yes
In-session collaboration	No	No	Partial	Yes
Guided format available	No	Yes	Yes	Yes
Privacy-first architecture	Partial	Partial	Partial	Yes (PDPA-aligned)
Medication-decliner targeting	No	No	No	Yes
<i>Note. AU = Australia; IE = Ireland; UK = United Kingdom; DE = Germany; TH = Thailand. PDPA = Personal Data Protection Act B.E. 2562.</i>				

4.2 EmMind/JaiGu System Architecture

The EmMind/JaiGu iCBT-Thai prototype was developed as a responsive web application and companion mobile application, employing a modular architecture in which each of the five system modules is directly traceable to one or more qualitative themes. Table 4 presents the complete module specification.

Table 4

EmMind iCBT-Thai System Module Specifications: Features, Source Themes, and Evidence Base

No.	Module	Functionalities	Source Themes	Evidence Base
1	Symptom Assessment & Monitoring	PHQ-9 administration; daily mood tracking; longitudinal symptom graphs; automated severity alerts	T1, T4	Kroenke et al. (2001); Andersson (2024)
2	Psychoeducation Hub	Thai-language video library; CBT triangle; 5-column thought model; depression neuroscience modules	T2, T5	Cuijpers et al. (2019); Atik et al. (2022)
3	CBT Skills Training	Interactive Thought Record; cognitive restructuring exercises; behavioural activation scheduler; breathing & mindfulness	T3	Wells (2011); Beck (2021)
4	Homework & Progress Tracking	Therapist-assigned tasks; automated reminders; completion dashboard; between-session mood diary	T6	Kazantzis et al. (2010); Mol et al. (2020)
5	Therapist Clinical Dashboard	Pre-session patient summary; in-session collaborative workspace; behavioral activation planner; treatment progress visualisation	T5, T6, T7	Atik et al. (2022); Etzelmueller et al. (2020)
<i>Note. PHQ-9 = Patient Health Questionnaire-9. CBT = Cognitive Behavioral Therapy. Module numbers correspond to the order of clinical workflow within a typical EmMind engagement session. Evidence base citations are to the peer-reviewed literature informing feature selection.</i>				

Module 1 (Symptom Assessment and Monitoring) directly addresses Themes 1 and 4. It incorporates a validated Thai-language PHQ-9 administration, a longitudinal daily mood tracking function with graphical feedback, automated severity alerts that trigger stepped-care guidance, and a privacy-first data architecture in which symptom data are stored locally with optional encrypted synchronisation.

Module 2 (Psychoeducation Hub) addresses Themes 2 and 5. It comprises a curated library of Thai-language psychoeducation videos produced in collaboration with certified CBT therapists, interactive presentations of the cognitive model and the five-column thought formulation, and content tiered to three levels of educational complexity. All content was independently reviewed by two senior psychiatrists for clinical accuracy prior to prototype development.

Module 3 (CBT Skills Training) addresses Theme 3. It provides an interactive Thought Record with guided Socratic prompts in Thai, a structured behavioural activation scheduling interface, and a library of therapist-recorded guided breathing and mindfulness exercises calibrated to Thai cultural and linguistic conventions. Each exercise is designed for completion in under ten minutes to address the nocturnal distress use-case identified in the qualitative findings.

Module 4 (Homework and Progress Tracking) addresses Theme 6. It enables therapists to assign specific CBT tasks to individual patients with due dates and priority ratings, delivers automated patient-facing reminders via in-app notification and optional SMS, and generates a pre-session patient summary dashboard displaying homework completion status, mood trajectory, and significant patient-reported events since the previous appointment.

Module 5 (Therapist Clinical Dashboard) addresses Themes 5, 6, and 7. It provides therapists with a longitudinal patient progress view, enables asynchronous assignment of psychoeducation modules and homework tasks, and incorporates a real-time shared workspace for collaborative in-session skill practice that persists as a between-session self-practice resource.

4.3 Privacy and PDPA Architecture

In response to the pervasive privacy concerns identified in Theme 1, EmMind/JaiGu's technical architecture was designed from the ground up as privacy-first. Key features include: pseudonymous user registration that does not require nationally identifying information; AES-256 encryption of all stored data; TLS 1.3 for all data in transit; a transparent, plain-language privacy notice written at a sixth-grade Thai reading level and reviewed by a legal expert in PDPA compliance; granular consent management that allows users to control each category of data processing independently; and a user-initiated data deletion function consistent with the right-to-erasure provisions of PDPA Section 33. The architecture was reviewed for compliance with the Thai PDPA B.E. 2562 by a registered data protection officer prior to prototype completion.

4.4 Usability Testing

Version 1.0 of the EmMind/JaiGu prototype was subjected to preliminary usability testing with a small convenience sample ($n = 5$; three individuals with depression, two therapists) using the Think Aloud Protocol [26]. Participants were asked to complete a structured scenario-based task sequence covering each module while verbalising their thoughts, and were subsequently interviewed using a semi-structured exit debrief protocol. Usability data were analysed using a heuristic framework derived from Nielsen's (1994) ten usability heuristics [27]. Four categories of usability issues were identified – navigation clarity, terminology consistency, notification frequency, and onboarding sequencing – and addressed in Version 1.1 prior to submission of this report.

5. Discussion

5.1 Principal Findings

This study provides the first systematic, user-centered, qualitative evidence base for the design of a culturally adapted iCBT system in Thailand. Seven thematically coherent and analytically distinct needs were identified, spanning psychological safety (T1), knowledge (T2), skill-building (T3), decision support (T4), clinical tools (T5–T7), and collaborative care (T7). These needs were operationalised into a five-module EmMind/JaiGu system architecture that is directly traceable to participant-generated evidence.

The study demonstrates that a user-centered qualitative approach, when systematically integrated with Design Thinking methodology, can produce actionable and contextually specific digital health system specifications.

5.2 Interpretation in the Context of Existing Literature

The primacy of psychological safety and anonymity as determinants of iCBT engagement (T1) is consistent with and extends the findings of Borghouts et al. (2021), who conducted a systematic review of barriers and facilitators to digital mental health engagement across 43 studies. The current findings suggest that in Thailand, privacy concerns are particularly acute and multi-layered, encompassing not only technical data security but also social identity protection and fear of disclosure by health professionals – a dimension not fully captured in the predominantly Western existing literature. This Thai-specific configuration of privacy concerns implies that technical encryption alone is insufficient; the platform’s social architecture – including naming conventions, registration processes, and therapist-patient data-sharing defaults – must be explicitly designed for stigma-protective engagement.

The structured skills training need (T3) and its temporal specificity – particularly the emphasis on nocturnal distress episodes – replicates and extends findings from Atik et al. (2022) and Lunkenheimer et al. (2021), but adds a contextually specific dimension: the absence of accessible, culturally appropriate mental health crisis resources in Thai communities means that iCBT’s 24/7 availability is not merely a convenience feature but a clinically significant capability that fills a genuine service gap. This finding has direct implications for the design of crisis-sensitive modules within iCBT platforms in resource-limited settings.

The therapist themes (T5–T7) closely parallel findings from Mol et al.’s (2020) qualitative study of therapist perspectives on blended CBT in the Netherlands and Atik et al.’s (2022) mixed-methods needs assessment in Germany. A consistent pattern across these studies is that therapist adoption of blended CBT is contingent not on scepticism about efficacy but on practical integration requirements: the availability of tools that reduce rather than increase clinical workload, that provide actionable between-session data, and that preserve therapeutic alliance across digital and in-person modalities. EmMind’s design directly addresses each of these requirements, which strengthens the basis for anticipating therapist adoption in future implementation.

5.3 The Case for Blended iCBT in the Thai Context

A notable finding across both participant groups was the consistent emphasis on the importance of integrating digital platform use with ongoing direct therapist contact, rather than positioning iCBT as a standalone self-help resource. This preference for a blended rather than fully unguided model is consistent with meta-analytic evidence: Etzelmueller et al.’s (2020) meta-analysis found that guided iCBT produced substantially larger effects than unguided iCBT in routine care settings. In the Thai context, this preference may additionally reflect cultural dimensions of therapeutic relationship – specifically, the importance of relational trust and hierarchical respect in the patient-therapist dyad – that may make fully autonomous self-help less culturally resonant than in individualistic Western contexts [28].

EmMind/JaiGu's architecture, which positions the platform as a clinical augmentation tool within a guided care model rather than a standalone intervention, is directly responsive to this finding.

5.4 Thailand-Specific Design Implications

Three contextually specific design implications emerge from this study that distinguish EmMind/JaiGu's requirements from those of existing iCBT platforms. First, the scarcity of high-quality Thai-language psychoeducation content represents a critical gap that existing platforms have not addressed and that constitutes a prerequisite for acceptable patient engagement. Second, the PDPA-aligned privacy architecture required by Thai data protection law — and specifically demanded by participants — exceeds the requirements of General Data Protection Regulation (GDPR)-compliant platforms developed for European contexts, requiring localised legal review and a bespoke consent management framework. Third, the targeting of individuals who specifically decline pharmacotherapy represents a clinically and ethically distinct user population whose pathway into iCBT differs from that of the general depression treatment-seeking population, requiring triage and clinical escalation functions calibrated to this specific entry point.

5.5 Limitations

Several limitations of this study should be acknowledged and considered in interpreting the findings. First, the sample of 16 participants, while consistent with qualitative research conventions and supported by evidence of theoretical saturation, limits the breadth of perspectives captured. In particular, the sample was drawn exclusively from urban Bangkok, and the findings may not fully represent the needs of individuals in rural and peri-urban settings, where digital infrastructure limitations, differing cultural norms, and reduced access to CBT-trained therapists may produce distinct need profiles. Future qualitative work should explicitly recruit from these contexts. Second, the purposive sampling strategy, while appropriate for the study objectives, does not permit claims of population representativeness, and the findings should be understood as generating rather than testing hypotheses. Third, this study evaluated user needs and prototype design; it did not assess the clinical efficacy, cost-effectiveness, or implementation fidelity of the EmMind system. These questions require evaluation through a rigorous randomised controlled trial powered to detect clinically meaningful differences in depression symptom outcomes. Fourth, despite systematic reflexivity practices, the principal investigator's clinical background as a psychiatrist may have introduced interpretive emphasis on clinical content dimensions at the expense of patient-experiential perspectives; this risk was partially mitigated by the inclusion of a co-analyst without a clinical background. Fifth, participant quotations were translated from Thai to English, and although a rigorous two-reviewer verification process was employed, nuances of meaning inherent to the Thai language may not be fully preserved in translation.

6. Conclusions

This qualitative study provides the first systematic, user-centered, and empirically grounded evidence base for the design of a culturally adapted iCBT system in Thailand. Seven clearly delineated, analytically

distinct, and operationally translatable needs were identified: privacy and psychological safety, accessible psychoeducation, structured around-the-clock skills training, treatment decision guidance, psychoeducation support tools, structured homework and monitoring systems, and collaborative in-session therapy tools. These needs converge on a blended care model in which digital augmentation of therapist-guided CBT is positioned as the primary mode of delivery, consistent with the best available meta-analytic evidence.

The EmMind/JaiGu iCBT-Thai prototype translates these seven user-grounded needs into a five-module system architecture characterised by Thai-language content, a PDPA-compliant privacy-first design, and therapist-patient collaborative functionality absent from all existing international iCBT platforms. These design choices constitute a contextually specific and evidence-grounded contribution to the digital mental health landscape in lower-resource, non-Western settings.

Future research priorities are threefold. First, a multi-site randomised controlled trial comparing EmMind-augmented guided CBT with waitlist control and with conventional CBT alone is required to establish clinical efficacy. Second, a process evaluation embedding qualitative methods within the RCT should examine therapist adoption, patient engagement trajectories, and the therapeutic mechanisms through which EmMind produces its effects. Third, an economic evaluation should quantify cost-effectiveness relative to current standard of care, with specific attention to the scalability implications for the Thai public mental health system.

Declarations

Conflicts of Interest

None of the authors has any financial or personal relationship that could be construed as a conflict of interest in relation to this study. The EmMind/JaiGu platform is a non-commercial research prototype; no commercial entity has had any role in study design, data collection or analysis, the decision to publish, or the preparation of this manuscript.

Ethics Approval and Consent to Participate

This study was approved by the Institutional Review Board, Faculty of Medicine, Chulalongkorn University (Approval COA No. 1484/2024, IRB No. 0481/66; approval date: 31 October 2024). All procedures were conducted in accordance with the Declaration of Helsinki (2013 revision). Written informed consent was obtained from all participants prior to enrolment. Participants were informed of their right to withdraw at any time without consequence for their clinical care.

Disclosure of Artificial Intelligence Assistance

In preparing this manuscript, the authors used artificial intelligence (AI) language model tools to assist with English-language editing and reference list formatting only. All research design, data collection, analysis, interpretation, conceptual framework development, and intellectual conclusions are the sole work of the named authors. AI tools were not used to generate, fabricate, expand, or substitute for any scientific content, data, or argument presented in this manuscript. The authors assume full and undivided responsibility for the accuracy, integrity, and originality of this work. This statement is made in accordance with the guidelines of the International Committee of Medical Journal Editors (ICMJE, 2023) regarding the use of AI in scholarly publishing.

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Author Contribution

T.B. wrote the main manuscript text and prepared all figures. All authors reviewed the manuscript.

Data Availability Statement

The datasets generated and analysed during the current study are not publicly available in full, as they contain interview transcript data that could permit participant re-identification. Anonymised excerpt data supporting the findings presented in this article are available from the corresponding author on reasonable request, subject to ethical approval and participant confidentiality requirements. The EmMind/JaiGu prototype is available for academic review upon request to the corresponding author.

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