Online Resource 2. Search strategies, eligibility criteria and design-tension examples

Table S1. Full database search strategies and records retrieved

All searches were run on 5 November 2025 and covered January 2015 to September 2025.

S1.1 MEDLINE

Interface	Ovid MEDLINE(R)
Date searched	5 November 2025
Fields searched	Multi-purpose field (.mp: title, abstract, original title, subject heading word, keyword heading word, floating sub-heading word, name of substance word, synonyms, unique identifier and supplementary concept words); no subject headings]
Limits applied	English language; publication years 2015 to 2025 (yr="2015 - 2025")
Records retrieved	581

1 ("mental health" or depress* or anxi* or wellbeing or "well-being" or PMAD or "perinatal mood and anxiety disorders").mp.

2 limit 1 to (english language and yr="2015 - 2025")

3 (perinatal or prenatal or antenatal or antepartum or postnatal or postpartum or maternal or paternal or mother or father or parent or neonatal or childbirth or pregnancy or "expectant mother" or "expectant father" or couple or dyad* or partner or spouse or coparent or "co parent").mp.

4 limit 3 to (english language and yr="2015 - 2025")

5 (chatbot or "chat bot" or "conversational agent" or bot or "conversational AI" or "artificial intelligence" or "generative AI" or AI or "large language model" or LLM or "natural language processing" or "digital assistant" or "virtual assistant" or transformer or GPT or "dialog system" or "machine learning").mp.

6 limit 5 to (english language and yr="2015 - 2025")

7 2 and 4 and 6

S1.2 PsycINFO

Interface	APA PsycInfo via ProQuest, Advanced Search
Date searched	5 November 2025
Fields searched	Abstract (abstract())
Limits applied	English language (la.exact("ENG")); publication date 1 January 2015 to 30 Septmeber (pd(20150101-20250930))
Records retrieved	232

abstract(("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders")) AND abstract((perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent")) AND abstract((chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning")) AND la.exact("ENG") AND pd(20150101-20250930)

S1.3 Emcare

Interface	Ovid Emcare
Date searched	5 November 2025
Fields searched	Multi-purpose field (.mp: title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, floating subheading word, device trade name, keyword heading word, candidate term word); no subject headings
Limits applied	English language; publication years 2015 to 2025 (yr="2015 - 2025")
Records retrieved	489
("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders") AND (perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent") AND (chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning")	

S1.4 CINAHL Complete

Interface	CINAHL Complete via EBSCOhost
Date searched	5 November 2025
Fields searched	(title, abstract, subject headings)
Limits applied	publication years 2015 to 2025; English language
Records retrieved	154
("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders") AND (perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent") AND (chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning")	

S1.5 IEEE Xplore

Interface	IEEE Xplore, Command Search
Date searched	5 November 2025
Fields searched	Full Text & Metadata
Limits applied	publication years 2015 to 2025
Records retrieved	761
("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders") AND (perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent") AND (chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning")	

S1.6 Web of Science

Interface	Web of Science Core Collection, Advanced Search
Date searched	5 November 2025
Fields searched	Abstract (AB=)
Limits applied	2015-01-01 to 2025-09-30 (Index Date)
Records retrieved	1,141
AB=(("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders") AND (perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent") AND (chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning"))	

S1.7 Scopus

Interface	Scopus, Advanced document search
Date searched	5 November 2025
Fields searched	title, abstract and keywords (TITLE-ABS-KEY)
Limits applied	publication years 2015 to 2025; English language
Records retrieved	1,817
(TITLE-ABS-KEY(("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders")) AND TITLE-ABS-KEY((perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent")) AND TITLE-ABS-KEY((chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning"))) AND PUBYEAR > 2015 AND PUBYEAR < 2025 AND (LIMIT-TO(LANGUAGE, "English"))	

S1.8 ACM Digital Library

Interface	ACM Digital Library, Advanced Search
Date searched	5 November 2025
Fields searched	Full text
Limits applied	publication years 2015 to 2025
Records retrieved	483
Abstract:("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders") AND AllField:(perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent") AND AllField:(chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning")	

S1.9 Cochrane CENTRAL

Interface	Cochrane Library
Date searched	5 November 2025
Fields searched	Title Abstract Keyword (word variations searched)
Limits applied	Publication date 01/01/2015 to 30/09/2025; no language limit
Records retrieved	387
("mental health" OR depress* OR anxi* OR wellbeing OR "well-being" OR PMAD OR "perinatal mood and anxiety disorders") AND (perinatal OR prenatal OR antenatal OR antepartum OR postnatal OR postpartum OR maternal OR paternal OR mother OR father OR parent OR neonatal OR childbirth OR pregnancy OR "expectant mother" OR "expectant father" OR couple OR dyad* OR partner OR spouse OR coparent OR "co parent") AND (chatbot OR "chat bot" OR "conversational agent" OR bot OR "conversational AI" OR "artificial intelligence" OR "generative AI" OR AI OR "large language model" OR LLM OR "natural language processing" OR "digital assistant" OR "virtual assistant" OR transformer OR GPT OR "dialog system" OR "machine learning")	

Database subtotal 6,045; manual searching and grey literature 73; total records retrieved 6,118.

Table S2. Full eligibility criteria by Population, Concept and Context (PCC) element

PCC element	Inclusion	Exclusion
Population	Individuals in the perinatal period (pregnancy to 12 months postpartum): pregnant people, mothers, fathers, non-birthing partners, dyads and couples. No restriction on age, ethnicity or geography.	Non-perinatal populations, or perinatal data not reported separately from a mixed sample.
Concept	AI-supported conversational agents (chatbots, voice, text or multimodal dialogue systems) for perinatal mental health, using rule-based, retrieval-based, classical machine-learning, LLM or hybrid approaches. Reports on system design, architecture, development, evaluation, ethics, or privacy. Must support interactive natural-language dialogue.	Non-conversational AI (image recognition, diagnostic classifiers without dialogue); static screening tools or non-interactive applications; obstetric or physiological monitoring with no mental-health or conversational component.
Context	Clinical, real-world, applied or development settings, evaluated with human participants, simulated interactions, datasets, or expert review. Targets perinatal mental health outcomes (depression, anxiety, stress, wellbeing) or user- or system-level outcomes (usability, engagement, feasibility, acceptability, computational performance, architecture, ethics and privacy).	Systems for pregnancy tracking or general health with no explicit mental health component.
Study design	Empirical primary studies with original contributions: randomised controlled trials, quasi-experimental, observational, pilot and feasibility, implementation, human–computer interaction, simulation and technical evaluations, and protocol papers	Reviews, commentaries, editorials and opinion pieces; registered protocols without methodological content or results; non-peer-reviewed outputs (blogs, unreviewed preprints, commercial white papers).

	with substantive methodological content. Quantitative, qualitative, or mixed methods. Peer-reviewed journal articles and full conference papers. Evaluations without human participants were eligible where they reported technical, architectural, or governance-relevant outcomes.	
Timeframe, language, availability	January 2015 to September 2025; English; full text available.	Published before 2015; non-English; abstract-only, posters or inaccessible full text.

Table S3. Six recurrent design tensions, with illustrative systems and studies (identified in 28 of 35 studies)

S/N	Tension	Trade-off	Illustrative systems and studies
1	Safety versus autonomy	Constrained interaction improves control but limits responsiveness; open-ended generation increases flexibility but also safety uncertainty.	Parentbot (Studies 1, 17, and 34); ALBA (Studies 14 and 22); NurtureBot (Study 7); MOMCare (Study 6)
2	Scale versus personalisation	Broad, low-resource delivery supports reach but may limit tailoring; greater personalisation increases data, infrastructure and computational demands.	Zuri (Study 2); Rover (Studies 27 and 35); Moment for Parents (Study 28)
3	Clinical accuracy versus accessibility	Clinically detailed content may be harder for users to understand, while simplification can improve accessibility but reduce nuance or clinical precision.	DIAN (Study 12); Maria (Study 19)
4	Privacy versus personalisation	Greater personalisation often requires more user data, increasing tension with data minimisation and privacy protection.	PPD screener (Study 4); HiBaby (Study 25); Woebot (Studies 5 and 30)
5	Automation versus clinical oversight	Automation supports scalability and reduces reliance on limited clinical capacity, but complicates human oversight and integration with health services when needs exceed the system's capabilities.	e-Midwife (Study 15); Dr. Joy (Study 18); Rosie (Study 29); Zuri (Study 2)
6	Father inclusion versus focused maternal care	Maternal-focused design excludes fathers and non-birthing partners; broader inclusion reduces father-specific tailoring and increases the support and escalation demand a system must meet.	Parentbot (Study 17); Dr. Joy (Study 18); Rover (Studies 27 and 35); NurtureBot (Study 7)

Study numbers refer to the study identifiers in Online Resource 3.