

MAPPING THE EVOLUTION OF ARTIFICIAL INTELLIGENCE IN COUNSELING RESEARCH: A BIBLIOMETRIC ANALYSIS OF TRENDS, THEMATIC STRUCTURES, AND RESEARCH GAPS FROM 2016 TO 2026

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Abstract. Artificial intelligence (AI) has become increasingly visible in counseling-related scholarship through chatbots, machine learning, natural language processing, large language models, digital mental health platforms, and decision-support systems. This study maps the evolution of AI in counseling research from 2016 to 2026 and interprets the field from a counseling-centered, human-in-the-loop perspective. Records were retrieved from Scopus and ScienceDirect and processed using sequential year, document type, subject area, and deduplication filters. From 340 initial records, 119 articles constituted the final bibliometric corpus. Descriptive bibliometric analysis, VOSviewer, and Bibliometrix/Biblioshiny were used to examine annual scientific production, keyword co-occurrence, temporal overlay, keyword frequency, thematic structure, and conceptual proximity. Publication output developed gradually from 2016 to 2022, accelerated after 2023, and reached its highest reported level in 2025 with 43 articles; the 2026 output remains provisional. Artificial intelligence and mental health form the principal organizing concepts, whereas counseling and psychotherapy are connected but less structurally prominent than machine learning, natural language processing, digital health, and symptom-oriented topics. Temporal and conceptual maps indicate a transition from telemedicine and eHealth toward ChatGPT, generative AI, and large language models. Counselor competence, counselor education, supervision, therapeutic alliance, multicultural counseling, school counseling, professional accountability, and evidence-based counseling outcomes remain weakly integrated. The study contributes a structured research agenda that emphasizes counselor-supervised AI, ethical governance, culturally responsive design, rigorous outcome evaluation, and the preservation of human professional responsibility. Bibliometric prominence is interpreted as evidence of scholarly attention, not as proof of clinical effectiveness or causal impact.

Keywords: Artificial intelligence; counseling; mental health; bibliometric analysis; VOSviewer; machine learning; human-in-the-loop

INTRODUCTION

Artificial intelligence has become a prominent technological development in contemporary research on health, mental health, and counseling. Across these domains, AI has been used for prediction, classification, monitoring, conversational interaction, natural language processing, information synthesis, and decision support (Graham et al., 2019; Torous et al., 2021). The expansion of AI has occurred alongside continuing pressure to improve the accessibility, integration, and responsiveness of mental health services (World Health Organization [WHO], 2022). Within this context, AI is increasingly discussed as a means of supporting early

identification, organizing complex information, extending psychoeducational resources, and assisting service delivery (Graham et al., 2019; WHO, 2021).

In counseling-related settings, AI is represented by rule-based chatbots, conversational agents, machine learning models, natural language processing systems, generative AI, and large language models (LLMs). Earlier studies evaluated automated conversational agents for cognitive behavioral support, emotional engagement, and psychoeducation (Fitzpatrick et al., 2017; Inkster et al., 2018). Subsequent reviews found that chatbots may support symptom management and user engagement, but the available evidence remains heterogeneous and is limited by study design, follow-up duration, safety assessment, and variability in intended use (Abd-Alrazaq et al., 2020; Vaidyam et al., 2019). More recent reviews indicate that LLMs are being investigated for screening, clinical assistance, counseling and education, and conversational support, although standardized validation and evidence for autonomous use remain insufficient (Hua et al., 2025; Jin et al., 2025).

The relevance of AI to counseling cannot be judged solely by computational performance or linguistic fluency. Counseling is an ethical, relational, culturally situated, and evidence-informed professional practice. It requires context-sensitive judgment, confidentiality, informed consent, collaboration, professional accountability, and attention to client vulnerability (American Counseling Association [ACA], 2014). The therapeutic alliance is also consistently associated with psychotherapy outcomes, underscoring that the quality of collaborative human relationships cannot be reduced to the production of supportive language (Flückiger et al., 2018). Accordingly, AI-generated responses should not be treated as equivalent to counselor competence or therapeutic responsibility.

Recent counseling-specific scholarship has begun to address these boundaries. AI-supported role-play may provide new opportunities for counseling skill development, but its educational value depends on careful instructional design, supervision, and verification (Maurya, 2024). Counselor education programs are also developing policies for generative AI, although program-specific guidance remains uneven (Campbell et al., 2025). Professional guidance emphasizes competence, transparency, informed consent, confidentiality, accountability, multicultural considerations, and human oversight when AI is incorporated into counseling services (National Board for Certified Counselors [NBCC], 2024). These developments support a human-in-the-loop position in which AI may assist with selected functions while counselors retain responsibility for interpretation, intervention, ethical decisions, and client welfare.

Bibliometric analysis is useful for examining how these technological, clinical, ethical, and professional concerns are represented across a rapidly expanding interdisciplinary literature. It enables the analysis of scientific production, co-occurrence networks, conceptual structures, and thematic development across large bodies of metadata (Donthu et al., 2021). VOSviewer supports the construction and visualization of bibliometric networks (van Eck & Waltman, 2010), while Bibliometrix/Biblioshiny provides an integrated environment for performance analysis and science mapping (Aria & Cuccurullo, 2017). These methods do not establish effectiveness or causality; instead, they reveal how a field is organized, which concepts are central, and which areas remain underdeveloped.

The present study maps the evolution of artificial intelligence in counseling research from 2016 to 2026. Its novelty lies in interpreting the broader AI and mental health literature through the lens of counseling-specific concerns, including professional competence, relational practice, human oversight, school counseling, cultural responsiveness, and ethical accountability. Rather than assuming that technological growth demonstrates clinical readiness, the study examines whether

counseling theories, professional practices, and human-centered safeguards are structurally integrated into the emerging knowledge base.

The study addresses the following research questions:

- RQ1. How did scientific production on artificial intelligence in counseling evolve from 2016 to 2026?
- RQ2. What dominant keywords, concepts, and thematic clusters characterize AI counseling research?
- RQ3. How are artificial intelligence, mental health, counseling, psychotherapy, chatbots, and machine learning conceptually connected in the bibliometric network?
- RQ4. What motor, basic, niche, and emerging or declining themes characterize the development of the field?
- RQ5. What research gaps remain in AI-supported counseling, particularly regarding human-in-the-loop practice, counselor competence, ethics, client safety, and evidence-based counseling outcomes?

Literature Background

Artificial Intelligence in Counseling and Digital Mental Health

Artificial intelligence in counseling refers to computational systems that support counseling-related functions, including screening, psychoeducation, documentation, pattern identification, risk flagging, digital interaction, service planning, and decision support. This definition positions AI as assistive infrastructure rather than as an autonomous counseling provider. The distinction is necessary because digital accessibility and fluent interaction do not, by themselves, demonstrate clinical validity, cultural appropriateness, or ethical safety (ACA, 2014; WHO, 2021).

AI-supported counseling overlaps with digital mental health, telepsychology, online counseling, e-counseling, cyber counseling, and digital psychiatry. These domains include mobile applications, social media analytics, chatbots, virtual environments, and remote service systems (Torous et al., 2021). Potential benefits include improved access, additional support between sessions, administrative efficiency, and personalization of psychoeducational resources. However, the evidence base for chatbot-supported mental health care remains uneven, and the intended function of a tool must be distinguished from the way users may actually use it (Abd-Alrazaq et al., 2020; American Psychological Association [APA], 2025).

Counseling as Relational and Evidence-Informed Practice

Counseling is shaped by collaborative goal setting, empathy, confidentiality, informed consent, professional boundaries, cultural responsiveness, and contextual interpretation. The counselor-client relationship is, therefore, not an optional component that can be separated from technical recommendations. Meta-analytic evidence on psychotherapy indicates that the alliance is meaningfully associated with outcomes across face-to-face and internet-based contexts (Flückiger et al., 2018). Although such evidence does not directly evaluate AI-supported counseling, it establishes a strong rationale for examining how AI may influence trust, disclosure, collaboration, and client autonomy.

Evidence-based counseling also requires more than the adoption of novel tools. In school counseling, evidence-based practice integrates research evidence, practitioner expertise, contextual knowledge, and student needs (Dimmitt & Zyromski, 2020). AI systems may assist data organization or resource selection, but they cannot independently determine whether an intervention is developmentally, culturally, institutionally, or ethically appropriate. Consequently,

counseling-specific evaluation should include process and outcome indicators rather than technical accuracy alone.

Chatbots, Natural Language Processing, and Generative AI

Chatbots and conversational agents are among the most visible AI applications in mental health. Early studies examined automated cognitive behavioral support and real-world engagement with conversational systems (Fitzpatrick et al., 2017; Inkster et al., 2018). Reviews suggest that these tools can facilitate psychoeducation, self-reflection, and engagement, while also identifying limitations in safety reporting, comparative designs, and long-term evidence (Abd-Alrazaq et al., 2020; Vaidyam et al., 2019).

Natural language processing is particularly relevant to counseling because client narratives, counselor reflections, emotional expressions, self-disclosure, and session dialogue generate rich textual data. NLP may support summarization, sentiment classification, risk flagging, and analysis of interaction patterns. However, counseling language is context-dependent: similar statements may carry different meanings according to culture, developmental stage, relationship history, risk level, and the broader course of counseling. Technical classification must therefore remain subject to human interpretation and verification (Miner et al., 2017; WHO, 2021).

Generative AI and LLMs extend these possibilities by producing flexible and context-responsive language. Recent reviews categorize LLM applications into screening, clinical assistance, treatment support, counseling, emotional support, and education, but also identify persistent problems with standardized evaluation, reproducibility, privacy, fairness, and clinical validation (Hua et al., 2025; Jin et al., 2025). Because LLMs can sound confident and empathic while generating inaccurate or unsafe content, linguistic plausibility should not be equated with professional judgment.

Counselor Competence, Education, and Professional Ethics

The introduction of AI creates new competence requirements for counselors and counselor educators. Relevant competencies include foundational AI literacy, the ability to recognize model limitations and hallucinations, critical appraisal of outputs, knowledge of data privacy, awareness of bias, documentation of AI use, and the capacity to distinguish psychoeducational assistance from professional intervention. NBCC (2024) explicitly places accountability for clinical decisions and client outcomes with the counselor and requires human oversight of AI-generated recommendations.

Counselor education is also emerging as a distinct area of inquiry. Maurya (2024) illustrates how generative AI can serve as a simulated client for counseling-skills role-play, while Campbell et al. (2025) show that counselor education programs have not uniformly developed program-specific generative AI policies. These studies move beyond general mental health technology by addressing how counselors are trained, supervised, and governed. However, their relative novelty suggests that counselor education remains a developing rather than a mature research cluster.

Professional ethics must be integrated into design and implementation rather than added after deployment. Early ethical analysis of artificial intelligence care providers emphasized explicit safeguards, professional responsibility, and design constraints (Luxton, 2014). Counseling-specific and cross-national analyses further emphasize the need to update ethical codes and governance frameworks for generative AI, particularly regarding competence, confidentiality, informed consent, accountability, and the limits of automation (NBCC, 2024; Ooi & Wilkinson, 2025). In school counseling, ethical obligations are heightened by students' ages, parental or guardian involvement, institutional data systems, crisis procedures, and equity concerns (American School Counselor Association [ASCA], 2022).

Human-in-the-Loop Counseling

Human-in-the-loop counseling describes an arrangement in which AI supports selected information-processing or decision-support functions. At the same time, a qualified counselor retains responsibility for interpretation, relational engagement, intervention planning, ethical judgment, and client safety. The model is consistent with broader health guidance that prioritizes human autonomy, transparency, accountability, inclusion, and safety (WHO, 2021). Survey evidence also suggests that mental health professionals are more receptive to AI for documentation and information synthesis than for replacing empathy or professional judgment (Doraiswamy et al., 2020). This position is consistent with professional guidance stating that AI should not replace clinical competence or the counselor-client relationship (NBCC, 2024).

The human-in-the-loop concept should be operationalized through task boundaries. Low-autonomy uses may include administrative drafting, resource organization, and preliminary summarization. Higher-risk uses include risk assessment, case formulation, treatment recommendation, crisis response, and decisions affecting vulnerable clients. As risk and autonomy increase, requirements for validation, supervision, documentation, informed consent, and institutional governance should become more stringent.

Bibliometric Analysis as a Method for Mapping Scientific Evolution

Bibliometric analysis offers a systematic approach to mapping the development and structure of a research field. Performance analysis describes publication output, while science mapping examines relationships among keywords, documents, authors, and themes (Donthu et al., 2021). Co-word analysis is particularly relevant to this study because it indicates whether counseling-specific constructs are central, connected, peripheral, or emerging within the broader AI and mental health literature.

VOSviewer is widely used to construct co-occurrence networks and temporal overlays (van Eck & Waltman, 2010, 2021). Bibliometrix/Biblioshiny supports thematic mapping, frequency analysis, and conceptual structure analysis (Aria & Cuccurullo, 2017). The resulting maps represent patterns of metadata association. They do not demonstrate that a technology is effective, that one topic causes another, or that frequently used keywords correspond to high-quality evidence.

METHODS

Research Design

This study employed a bibliometric analysis based on a structured search and database filtering. Bibliometric analysis was selected because it enables examination of annual publication output, keyword co-occurrence, thematic development, temporal shifts, and conceptual proximity within a defined corpus of literature (Donthu et al., 2021). Science mapping was used to visualize relationships among terms and thematic groupings (Cobo et al., 2011; van Eck & Waltman, 2010). The study did not conduct a clinical meta-analysis, calculate pooled effect sizes, or appraise the effectiveness of individual interventions. The findings, therefore, indicate patterns of scholarly production and conceptual association, not causal relationships, diagnostic validity, treatment effectiveness, or equivalence with human counseling.

Data Sources and Search Period

Records were retrieved from Scopus and ScienceDirect. Scopus served as the primary multidisciplinary indexing database because it covers literature across psychology, social science, health professions, education, computer science, and related domains. ScienceDirect was used as a supplementary publisher platform to increase the retrieval of relevant Elsevier-hosted literature.

Because the platforms differ in coverage and metadata structure, records were merged and deduplicated before analysis.

The search covered publications indexed from 2016 through the data-collection cut-off in 2026. Because data collection was completed before the end of 2026, records from that year were treated as provisional in the annual trend analysis.

Search Strategy

The search strategy combined AI-related terms with counseling and adjacent helping-profession terms in titles, abstracts, and keywords. The Scopus-ready core query was:

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TITLE-ABS-KEY ( "artificial intelligence" OR "AI" OR "machine learning" OR "deep learning"
OR "natural language processing" OR "large language model" OR "generative AI" OR chatbot* )
AND
TITLE-ABS-KEY ( counsel* OR "school counseling" OR "psychological counseling" OR "online
counseling" OR "e-counseling" OR "cyber counseling" OR psychotherapy OR "mental health
service" )
AND
PUBYEAR > 2015 AND PUBYEAR < 2027
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The wildcard counsel* captured counseling, counseling, counselor, counselor, and related variants. Psychotherapy and mental health services were included to retrieve adjacent studies relevant to counseling, even when the term "counseling" was absent. The search expression was adapted to the field and syntax options available in ScienceDirect while preserving the same AI-related and counseling-related concepts used in Scopus.

Eligibility Criteria

Academic articles and review articles published between 2016 and 2026 were eligible when they addressed AI in counseling, online counseling, e-counseling, cyber counseling, psychotherapy, or digital mental health services. Editorials, opinion papers, news items, nonacademic records, publications before 2016, duplicate records, and studies outside counseling or mental health service contexts were excluded. Table 1 summarizes the criteria used to construct the corpus.

Table 1. Search Strategy and Inclusion Criteria

Component	Criteria
Period	2016-2026
Databases/platforms	Scopus and ScienceDirect
Document type	Academic articles and review articles
Subject areas	Computer Science, Social Science, Psychology, Health Professions, Decision Sciences, and Neuroscience
Topical focus	AI in counseling, online counseling, e-counseling, cyber counseling, psychotherapy, or digital mental health services
Included technologies	Artificial intelligence, machine learning, deep learning, natural language processing, large language models, generative AI, and chatbots
Exclusion criteria	Editorials, opinion papers, news items, nonacademic records, AI studies unrelated to counseling or mental health services, publications before 2016, and duplicate records

Screening and Data Selection

A sequential database-filtering process was applied. The search identified 188 records in Scopus and 152 in ScienceDirect, for a total of 340 records. The 2016–2026 year filter retained 326 records. Document-type filtering retained 224 records, and subject-area filtering retained 126 records. After deduplication, 119 articles constituted the final bibliometric corpus. Table 2 presents the complete numerical sequence.

Topical relevance was operationalized through the Boolean search structure, the predefined eligibility criteria, and the database filters. Records were retained when they addressed AI in counseling, psychotherapy, online counseling, e-counseling, cyber counseling, or digital mental health services. Records outside these topical and document-type boundaries were excluded during database filtering.

The reporting process was informed by the transparency principles of PRISMA 2020, particularly the documentation of identification, filtering, and inclusion decisions (Page et al., 2021). The study does not claim full PRISMA compliance because it is a bibliometric mapping study, and the source documentation does not contain all items required for a systematic review.

Table 2. Screening Process

Screening Stage	Scopus	ScienceDirect	Combined
Records identified	188	152	340
After a year filter, 2016-2026	181	145	326
After the document-type filter	106	118	224
After the subject-area filter	64	62	126
After deduplication	—	—	119

Metadata Preparation and Term Standardization

Records from Scopus and ScienceDirect were merged before bibliometric analysis. Duplicate records were identified across the combined exports and removed prior to the construction of the final 119-article corpus.

Bibliometric mapping is sensitive to spelling variants, singular and plural forms, abbreviations, and database-generated index terms. During interpretation, equivalent forms such as artificial intelligence and AI, chatbot and chatbots, counseling and counseling, counselor and counselor, eHealth and e-health, and large language model and LLM were treated as semantically related. The figures preserve the terminology used in the available analytical outputs, so generic index terms were interpreted cautiously rather than automatically treated as counseling-specific constructs.

Bibliometric Analysis

The analysis combined descriptive performance analysis and science mapping. Annual scientific production was used to describe publication growth. Keyword co-occurrence analysis was used to identify prominent concepts and relationships among terms. VOSviewer generated the co-occurrence network and overlay visualization, while Bibliometrix/Biblioshiny supported keyword frequency analysis, the word cloud, thematic mapping, and conceptual structure analysis (Aria & Cuccurullo, 2017; van Eck & Waltman, 2010).

In the VOSviewer maps, node size represents keyword occurrence, links represent co-occurrence relationships, and colors represent clusters or the average publication period in the overlay. In the thematic map, centrality represents the degree to which a theme is connected to the broader field, whereas density represents internal development. High-centrality and high-density themes are interpreted as motor themes; high-centrality and lower-density themes as basic themes;

high-density and lower-centrality themes as niche themes; and low-centrality and low-density themes as potentially emerging or declining themes.

All analyses were conducted using the settings applied in the original VOSviewer and Bibliometrix/Biblioshiny workflows. The interpretations focus on stable features visible in the outputs, including node prominence, co-occurrence links, temporal positioning, thematic centrality and density, and conceptual proximity.

All visualizations were interpreted as representations of publication metadata and conceptual association. Frequency, proximity, and centrality were not interpreted as evidence of clinical effectiveness, methodological quality, or causal influence.

RESULTS AND DISCUSSION

Results

Annual Scientific Production

Figure 1 shows that publication output developed gradually from 2016 to 2022 and increased more sharply after 2023. The pattern indicates that AI counseling research has moved from a relatively small body of literature to a more visible interdisciplinary field. The increase after 2023 may reflect broader scholarly attention to widely accessible generative AI and large language models; however, the bibliometric series alone cannot establish a causal relationship between technological releases and publication growth.

The highest reported annual output occurred in 2025, with 43 articles. The dataset includes 11 articles for 2026, but this value is provisional because data collection occurred before the end of the year. The annual values shown in Table 3 and Figure 1 account for all 119 articles in the final bibliometric corpus.

Table 3. Annual Distribution of Articles

Year	Number of Articles
2016	0
2017	0
2018	2
2019	5
2020	8
2021	8
2022	12
2023	6
2024	24
2025	43
2026	11
Total	119

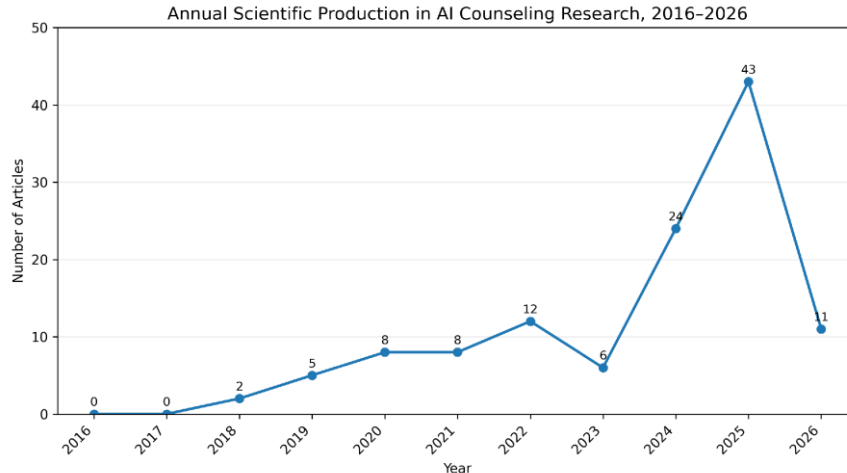


Figure 1. Annual scientific production in AI counseling research from 2016 to 2026.
 Note. The distribution includes all 119 articles in the final bibliometric corpus. The 2026 data are provisional because data collection was completed before the end of the publication year.

Keyword Co-Occurrence Network and Thematic Clusters

The VOSviewer co-occurrence network positions artificial intelligence and mental health as the principal organizing nodes of the field (Figure 2). Artificial intelligence is closely connected to mental health, machine learning, psychotherapy, counseling, chatbots, anxiety, humans, and online counseling. This structure indicates that AI counseling research is embedded within a broader mental health technology literature rather than forming a fully autonomous counseling-specific domain.

The network contains interconnected technological, service-delivery, clinical, and human-related clusters. One grouping brings together LLM, ChatGPT, counselor, content analysis, and related language-based terms, suggesting an emerging research front concerned with generative systems and counseling interaction. Another grouping includes eHealth, telemedicine, online systems, and digital health, reflecting the service infrastructure from which AI-supported counseling has developed. A central grouping around artificial intelligence, mental health, machine learning, and psychotherapy represents the field's dominant interdisciplinary core.

Counseling and psychotherapy are connected to the central AI and mental health nodes. However, counseling-specific terms are generally smaller and less densely organized than broad technological and symptom-oriented terms. This bibliometric position can be interpreted as evidence that counseling is present in the literature but has not yet become its principal theoretical organizer. Constructs such as counselor competence, counselor education, supervision, therapeutic alliance, multicultural counseling, and evidence-based counseling outcomes are not visible as major nodes. In response to RQ2 and RQ3, the field is characterized by strong integration between AI technologies and mental health services, alongside weaker structural integration of profession-specific counseling concepts.

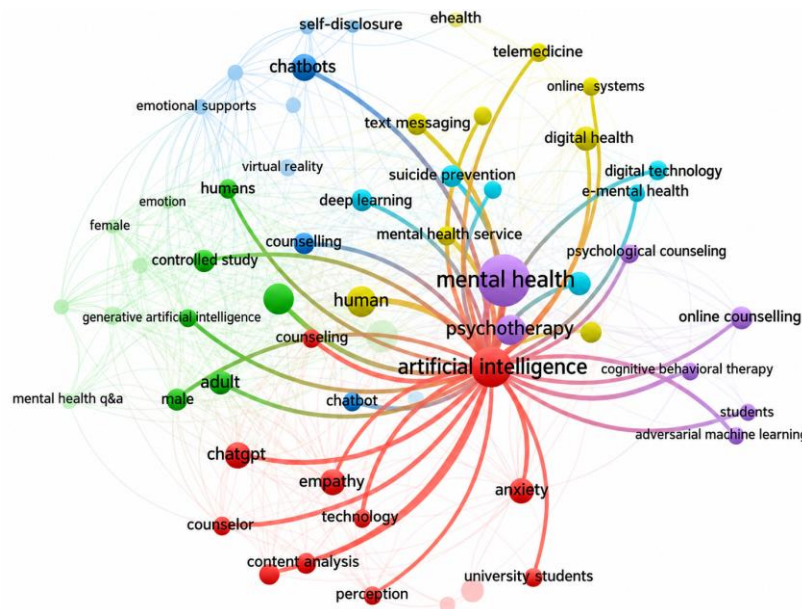


Figure 2. VOSviewer co-occurrence network of AI counseling research. Note. Node size represents frequency, links represent co-occurrence relationships, and colors represent thematic clusters.

Overlay Visualization

The overlay visualization provides a temporal view of topic emergence (Figure 3). Earlier themes include telemedicine, self-disclosure, eHealth, and online systems, suggesting that the initial phase of the literature was organized around remote delivery, digital access, and interaction through established online infrastructures. These themes provided a service context within which later AI applications could develop.

More recent terms include ChatGPT, large language model, generative artificial intelligence, and online counseling. Their placement indicates a transition from primarily platform-based digital mental health toward language-generating systems capable of producing adaptive conversational content. Artificial intelligence, mental health, and machine learning remain central throughout the overlay, demonstrating continuity in the field's technical and clinical foundations despite the emergence of newer tools.

The temporal shift does not demonstrate that newer technologies are safer or more effective than earlier systems. Instead, it indicates a change in scholarly attention and technological form. The relative absence of newly prominent terms related to counselor supervision, therapeutic alliance, informed consent, or professional accountability suggests that professional and relational research has not expanded at the same pace as generative technology research.

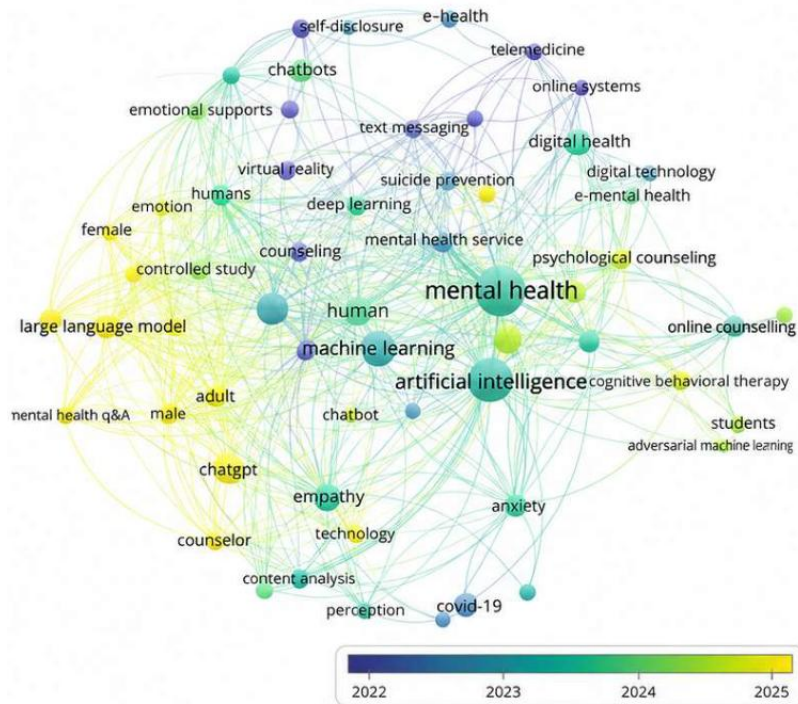


Figure 3. Overlay visualization of topic evolution in AI counseling research. Note. Earlier terms include telemedicine, self-disclosure, and eHealth; newer terms include ChatGPT, large language model, generative AI, and online counseling.

Keyword Frequency and Word Cloud

The word cloud reinforces the centrality of artificial intelligence and mental health (Figure 4). Other prominent terms include machine learning, natural language processing, psychotherapy, human, anxiety, depression, chatbot, and digital health. The pattern indicates that the field is organized primarily around computational methods, broad mental health concerns, and common symptom categories.

The prominence of machine learning and natural language processing reflects the methodological orientation of the literature. The visibility of psychotherapy and counseling is relevant to helping practices, but their relative size suggests they are not as dominant as the broader AI and mental health categories. The term human requires cautious interpretation: it may represent human-centered concerns, but it may also reflect database indexing conventions or demographic descriptors. Keyword frequency alone cannot establish the conceptual depth with which a term is treated.

The comparatively limited visibility of counselor competence, alliance, supervision, school counseling, and multicultural counseling supports the interpretation that professional counseling constructs remain underdeveloped. The word cloud, therefore, complements rather than replaces the network analysis by showing the concentration of attention without explaining the quality or direction of relationships.



Figure 4. Dominant keyword word cloud. Note. Artificial intelligence and mental health appear as dominant terms, followed by machine learning, natural language processing, psychotherapy, human, anxiety, depression, chatbot, and digital health.

Thematic Map

The thematic map organizes the field into motor, basic, niche, and emerging or declining themes (Figure 5 and Table 4). Machine learning, natural language processing, and humans appear as motor themes, indicating high relevance and internal development. Their position suggests that computational analysis of language and human-related data is a major driver of the literature. The presence of humans in this quadrant should not automatically be interpreted as evidence of a mature human-centered counseling framework; the cluster content and indexing context must also be considered.

Mental health, artificial intelligence, digital health, and depression appear as basic themes. These terms are highly connected to the broader field but less internally developed as cohesive thematic clusters. Their role is foundational: they link the major technological and clinical components of the literature. Deep learning, digital technology, and e-mental health appear as niche themes, suggesting specialized development with weaker integration into the field's overall conceptual network.

Chatbots, virtual reality, and telehealth occupy the emerging or declining quadrant. This location is inherently ambiguous because low centrality and density may indicate either early-stage emergence or reduced novelty. In the context of the overlay visualization, chatbots are more plausibly interpreted as a transforming theme being reconfigured by generative AI. In contrast, telehealth may have shifted from an innovative research topic toward a routine service infrastructure.

In response to RQ4, the thematic structure is driven by computational and broad mental health concepts, while counseling-specific professional themes do not appear as distinct motor or basic clusters. This absence indicates an opportunity to develop a more clearly articulated counseling research program around competence, alliance, supervision, culture, and accountable implementation.

Table 4. Dominant Themes and Interpretations

Thematic Category	Main Terms	Interpretation
Motor themes	Machine learning, natural language processing, human	Highly relevant and internally developed themes that drive the field, while the meaning of human requires contextual interpretation
Basic themes	Mental health, artificial intelligence, digital health, depression	Foundational concepts that connect the broader technological and mental health literature
Niche themes	Deep learning, digital technology, e-mental health	Specialized and internally developed themes with lower integration into the overall network
Emerging/declining themes	Chatbots, virtual reality, telehealth	Themes that may be emerging, transforming, routinizing, or declining; longitudinal evidence is required to distinguish these trajectories

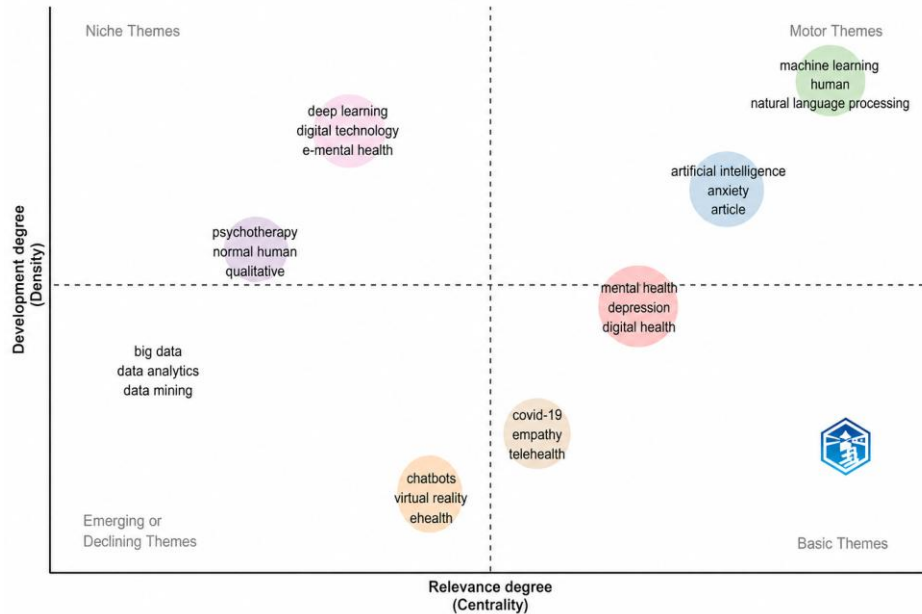


Figure 5. Thematic map of AI counseling research. Note. The map positions themes according to centrality and density into motor, basic, niche, and emerging/declining categories.

Conceptual Structure Map Based on Multiple Correspondence Analysis

The multiple correspondence analysis map in Figure 6 shows the proximity of terms across two dimensions. Dimension 1 accounts for 58.79% of the represented inertia, and Dimension 2 accounts for 12.28%. Terms such as large language model, natural language processing, machine learning, generative artificial intelligence, counseling, psychotherapy, emotional support, behavioral research, and mental health services occupy different positions within the conceptual space. The relative proximity of LLM, NLP, machine learning, and generative AI suggests that language-based systems are becoming a bridge between technical and helping-profession topics. Behavioral research and emotional support occupy a more distinct area, indicating that

psychosocial processes are connected to, but not fully integrated with, the central technical cluster. Counselor appears in a separate region of the map, which can be interpreted as evidence that counselor-focused scholarship remains conceptually peripheral to the main AI research structure. The multiple correspondence analysis map does not establish causal relationships or disciplinary boundaries. It represents similarity in term-use patterns. When interpreted alongside the network, word cloud, and thematic map, it reinforces the conclusion that AI counseling research is multidimensional but remains more coherently organized around technology and general mental health than around counselor education, professional practice, or relational theory.

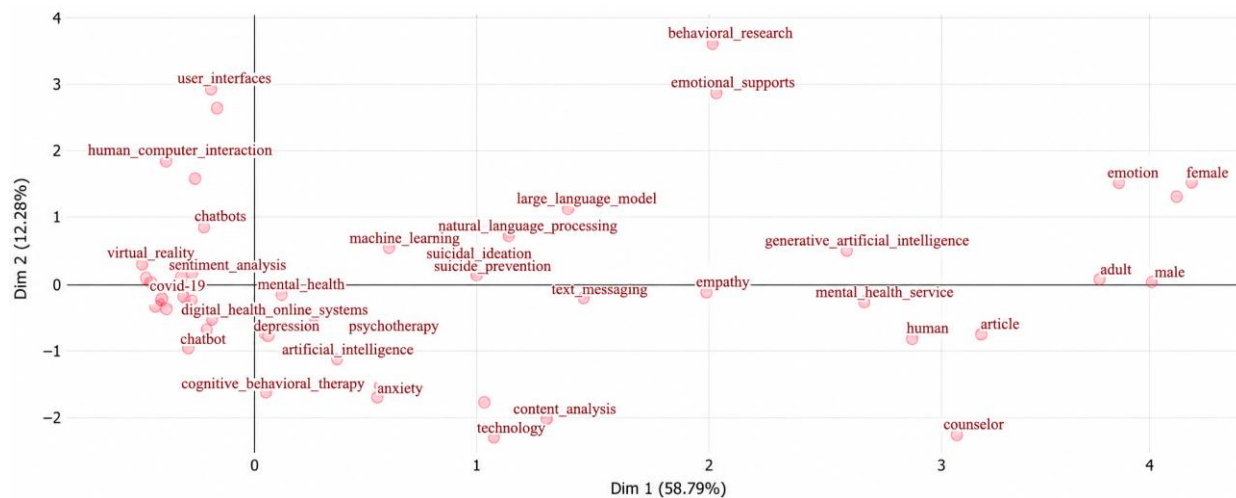


Figure 6. Conceptual structure map based on multiple correspondence analysis. Note. Dimension 1 explains 58.79%, and Dimension 2 explains 12.28%; distances indicate conceptual proximity, not causal relationships.

Synthesis of Findings

Across the visualizations, the same structural pattern is evident: rapid publication growth, strong centrality of AI and mental health, increased attention to language-based generative systems, and comparatively weak integration of counseling-specific professional constructs. The bibliometric evidence identifies gaps in counselor competence, counselor education, supervision, therapeutic alliance, multicultural responsiveness, school counseling, informed consent, professional accountability, and evidence-based counseling outcomes.

These gaps do not imply that no relevant studies exist. Rather, they indicate that these topics do not yet function as dominant or highly connected organizers of the literature captured by the search strategy. RQ5 is therefore answered by identifying the need to shift from technology-centered feasibility research toward counselor-supervised, ethically governed, culturally responsive, and outcome-oriented investigation.

Discussion

Interpretation of Publication Growth

The acceleration after 2023 supports the view that AI-supported mental health and counseling research has entered a period of rapid expansion. This pattern is consistent with recent reviews documenting growing investigation of LLMs across screening, clinical assistance, treatment support, counseling, and education (Hua et al., 2025; Jin et al., 2025). The present bibliometric

analysis extends those reviews by showing how the broader field is organized conceptually and by locating counseling within that structure.

Publication growth should not be interpreted as evidence of maturity. A field may expand because a technology is accessible, visible, or novel, even when evaluation standards remain underdeveloped. Reviews of chatbots and generative systems continue to identify heterogeneity, limited longitudinal evidence, inconsistent safety assessment, and inadequate comparison with professional care (Abd-Alrazaq et al., 2020; Hua et al., 2025; Vaidyam et al., 2019). The increase in output, therefore, establishes research momentum rather than readiness for autonomous counseling practice.

Intellectual and Thematic Structure of the Field

The network and thematic results show that the literature is organized around an interdisciplinary core linking artificial intelligence, mental health, machine learning, natural language processing, psychotherapy, digital health, and symptom-related terms. This configuration supports earlier accounts of AI as a collection of analytic and conversational technologies applied across mental health contexts (Graham et al., 2019; Torous et al., 2021). It also shows that counseling research is not isolated from the broader digital mental health field.

At the same time, counseling is more often connected to the central network than positioned as its primary theoretical anchor. The smaller and less cohesive presence of counselor, counseling, and psychological counseling suggests that much of the corpus approaches counseling through the categories of mental health technology or psychotherapy. This distinction matters because the goals, professional roles, institutional settings, and ethical frameworks of counseling cannot be assumed to be identical to those of psychiatry, clinical psychology, or general-purpose wellness technology.

Transition From Digital Mental Health Toward Generative AI and LLMs

The overlay visualization indicates a transition from telemedicine, eHealth, and online systems toward ChatGPT, LLMs, and generative AI. Earlier digital systems primarily altered access and delivery channels, whereas generative systems also produce content, simulate dialogue, summarize information, and propose responses. This changes the locus of risk: errors are no longer limited to access, transmission, or usability but may also involve fabricated information, inappropriate reassurance, over-affirmation, contextual misunderstanding, and unsafe recommendations (APA, 2025; Rahsepar Meadi et al., 2025).

The transition also creates opportunities for professional education and low-autonomy support. For example, AI-generated client simulations may help counselors-in-training practice selected skills when embedded in structured teaching and supervision (Maurya, 2024). However, simulation performance does not demonstrate competence in real counseling encounters, where clients present evolving histories, nonverbal communication, cultural meaning, power dynamics, and risk. Research should therefore distinguish educational simulation, administrative assistance, decision support, and direct client-facing intervention.

Limited Integration of Counseling-Specific Theories and Constructs

The relative absence of counselor competence, counselor education, supervision, therapeutic alliance, multicultural counseling, and school counseling from the dominant maps indicates a theoretical imbalance. The literature captured in this study is rich in technology and broad mental health concepts but comparatively limited in profession-specific constructs. This finding extends prior reviews by identifying not only methodological and ethical limitations, but also a disciplinary gap: counseling theories and professional practices have not yet become central organizers of AI research.

This gap is especially consequential for the therapeutic alliance. Alliance research emphasizes collaboration, trust, bond, and agreement on goals and tasks as important components of therapeutic work (Flückiger et al., 2018). AI may alter each of these processes by changing how clients disclose information, how counselors prepare for sessions, and how recommendations are generated. Future research should examine whether AI use strengthens, disrupts, or redistributes trust between client, counselor, institution, and technology.

Implications for Counselor Competencies and Counselor Education

Counselor competence must expand to include critical AI literacy without reducing professional education to technical tool use. Counselors need to understand what AI systems can and cannot infer, how outputs may be biased or fabricated, which data are retained, and when a recommendation requires rejection or escalation. NBCC (2024) places responsibility for clinical decisions with the counselor and identifies competence, oversight, confidentiality, transparency, and informed consent as core requirements.

Counselor education programs need explicit policies and curricula addressing generative AI. Campbell et al. (2025) found that program-specific AI policies in counselor education were limited, indicating that institutional guidance may not adequately address the profession's distinctive ethical responsibilities. Training should include supervised analysis of AI outputs, documentation practices, cultural bias testing, privacy risk assessment, simulated ethical dilemmas, and clear boundaries between learning support and unsupervised professional practice. School counselor preparation also requires alignment with professional competencies and ethical standards related to student welfare, evidence-based practice, cultural responsiveness, data use, and collaboration (ASCA, 2022, 2025). These competencies provide a professional framework for deciding whether an AI application supports or undermines appropriate school counseling roles.

Implications for Counseling Practice and Therapeutic Relationships

In practice, AI is most defensible when its role is bounded, transparent, and reviewable. Lower-risk applications may include drafting nonconfidential educational materials, organizing resources, preparing generic worksheets, or assisting with administrative documentation, provided appropriate privacy safeguards are in place. Applications that interpret client narratives, classify risk, recommend interventions, or respond directly to crisis disclosures require substantially stronger validation and oversight.

The counselor-client relationship must remain visible within any AI-supported workflow. Clients should understand whether AI is used, what data is processed, what limitations apply, and how they can decline its use without losing access to appropriate services. Counselors should also monitor whether AI changes disclosure patterns, client autonomy, expectations of immediacy, or confidence in professional judgment. These relational outcomes require direct empirical study rather than assumption.

Ethical and Human-in-the-Loop Implications

The bibliometric gaps and professional literature converge on the need for human-in-the-loop governance. WHO (2021), NBCC (2024), and Ooi and Wilkinson (2025) emphasize overlapping principles of human responsibility, transparency, competence, privacy, safety, and accountability. In counseling, these principles should be translated into operational safeguards: risk-based task classification, mandatory human review, documentation of AI use, informed consent, crisis-escalation pathways, auditability, and procedures for reporting harmful outputs. Human oversight must be substantive rather than symbolic. A counselor cannot be considered meaningfully in the loop when recommendations are accepted automatically, when the system's data practices are unknown, or when workload makes careful review impossible. Future studies

should report who reviewed AI outputs, what criteria were applied, how disagreements were resolved, and whether counselors could override or discontinue the system.

Implications for School Counseling and Global South Contexts

School counseling is notably underrepresented despite AI's relevance to student needs assessment, preventive services, psychoeducation, documentation, and referral planning. School environments introduce distinct obligations involving minors, parental or guardian consent, student records, developmental appropriateness, collaboration with teachers and administrators, and crisis response. Ethical use also requires attention to whether automated screening or prediction reproduces inequities across language, disability, gender, socioeconomic status, or cultural groups (ASCA, 2022).

The weak visibility of the Global South and non-English counseling contexts is equally important. LLMs are commonly developed and evaluated in English-dominant, high-resource environments, whereas the meaning of counseling is shaped by language, religion, family structures, community expectations, educational systems, and local regulations. Ooi and Wilkinson (2025) demonstrate the value of examining AI governance across national counseling codes. Research in Indonesia and other underrepresented settings should evaluate cultural and linguistic fit, professional feasibility, institutional governance, and client acceptability rather than importing models without local validation.

Future Research Agenda

The field should progress from novelty-focused studies toward a staged evidence agenda. First, researchers should define the intended counseling function and level of autonomy. Second, technical performance should be evaluated alongside safety, bias, explainability, privacy, and cultural validity. Third, studies should examine counselor behavior, client experience, alliance, and counseling outcomes. Fourth, implementation research should assess supervision, workflow, training, cost, governance, and sustainability in real-world institutions.

Priority designs include controlled and longitudinal studies, mixed-methods evaluations, counselor-in-the-loop experiments, cross-cultural validation, participatory design with clients and practitioners, and audits of crisis and bias performance. Bibliometric mapping should also be updated periodically to determine whether counseling-specific themes become more central as the field matures.

Research Gaps and Future Research Agenda

The identified gaps are summarized in Table 5. The table translates bibliometric underdevelopment into testable priorities while maintaining a clear distinction between assistive AI and autonomous professional practice.

Table 5. Research Gaps and Future Research Agenda

Research Gap	Why It Matters	Future Research Direction
Human-in-the-loop counseling	AI cannot assume counselor judgment, ethical responsibility, or relational accountability.	Develop and test counselor-supervised models with explicit task boundaries, review criteria, override authority, and audit trails.
Counselor competence	Safe adoption depends on critical AI literacy, knowledge of privacy, recognition of bias, and verification of outputs.	Design and evaluate AI literacy and ethics curricula for counselors, supervisors, and counselor educators.
Counselor education and	Training and supervision policies have not developed	Examine program-specific policies, simulated-client pedagogy, supervision

Research Gap	Why It Matters	Future Research Direction
supervision	uniformly alongside generative AI.	competencies, and gatekeeping procedures.
Ethics and safety	Counseling includes sensitive disclosures, vulnerable clients, and crises.	Empirically evaluate consent, confidentiality, data security, bias, crisis escalation, explainability, and accountability.
Evidence-based outcomes	Bibliometric prominence and technical accuracy do not demonstrate counseling effectiveness.	Conduct controlled, longitudinal, and mixed-methods studies of the counseling process, client experience, and outcomes.
Therapeutic alliance	AI may alter trust, disclosure, collaboration, empathy, and client autonomy.	Study how AI-supported workflows influence the counselor-client alliance and distribution of trust.
School counseling context	Student age, school records, parent/guardian involvement, and institutional policy create distinct risks.	Evaluate preventive, developmental, and data-support applications in schools with age-appropriate safeguards.
Multicultural and Global South contexts	Models may reproduce linguistic, cultural, and institutional bias.	Conduct culturally responsive research in Indonesia and other underrepresented contexts using local languages and governance requirements.
Multimodal AI	Text, voice, facial expression, and behavioral data may increase insight while also increasing surveillance and privacy risks.	Develop minimal-data, consent-based multimodal systems and evaluate cross-cultural misclassification.
Generative AI reliability	LLMs may hallucinate, over-affirm, or provide unsafe or inconsistent guidance.	Develop counseling-specific benchmarks, adversarial safety tests, crisis protocols, and mandatory human verification.
Professional regulation	AI may blur boundaries between self-help, wellness, psychoeducation, and professional counseling.	Develop risk-tiered policies distinguishing assistive tools from autonomous or direct-to-client interventions.

Practical and Theoretical Implications

Implications for Counselors

Counselors should treat AI outputs as provisional information requiring professional evaluation. Practice policies should define approved tools, prohibited data, informed-consent requirements, documentation procedures, and escalation pathways. Counselors should be able to explain the purpose and limitations of AI use in language appropriate to the client. They should provide a non-AI alternative when feasible and professionally indicated.

Implications for Counselor Education and Supervision

Counselor education should integrate AI literacy with ethics, counseling theory, multicultural competence, evidence appraisal, and supervised practice. Supervisors need sufficient knowledge

to evaluate supervisees' use of AI, discuss it in supervision agreements, review associated risks, and intervene when use threatens client welfare or professional development (Campbell et al., 2025; NBCC, 2024).

Implications for AI Developers

Developers should collaborate with counselors, clients, educators, and institutional stakeholders throughout the design and evaluation phases. Systems should disclose intended use, limitations, data practices, and known failure modes. High-risk outputs should be explainable and reviewable, and systems should not present themselves as autonomous counselors or therapists when they lack professional regulation and demonstrated evidence.

Implications for Educational and Mental Health Institutions

Institutions should establish governance procedures covering procurement, privacy review, informed consent, staff competence, tool validation, audit trails, supervision, incident reporting, and emergency response. Institutional approval should be based on the tool's function and risk, rather than on the general label of "AI." Uses involving student records, crisis information, or intervention recommendations require heightened review.

Theoretical Implications for Counseling Research

AI-supported counseling requires theoretical integration between counseling process research and human-centered technology design. Future models should specify how AI interacts with alliance, empathy, autonomy, meaning-making, multicultural responsiveness, counselor judgment, and professional accountability. Human-in-the-loop counseling should be tested as an operational model with measurable task boundaries and outcomes rather than used only as an ethical slogan.

Implications for Policy and Regulation

Professional associations and regulators should distinguish among low-risk administrative assistance, psychoeducational support, counselor-facing decision support, client-facing interaction, and autonomous intervention. Oversight requirements should increase with data sensitivity, client vulnerability, and system autonomy. Cross-national work is needed because counseling regulation, privacy law, educational policy, and professional roles differ across jurisdictions (Ooi & Wilkinson, 2025).

Limitations

This study has several limitations. First, the dataset was limited to Scopus and ScienceDirect. Relevant studies indexed in Web of Science, PubMed, PsycINFO, IEEE Xplore, ACM Digital Library, ERIC, or other sources may not have been included. ScienceDirect is also a publisher platform rather than a multidisciplinary citation index, which may introduce differences in metadata and coverage when combined with Scopus.

Second, the 2026 data are provisional and should not be interpreted as evidence of declining interest in publishing. Third, bibliometric analysis depends on the quality of metadata. Incomplete author keywords, database-generated index terms, spelling variants, and inconsistent terminology may affect network structure. The available figures also preserve several generic index terms, so their substantive meaning must be interpreted cautiously.

Fourth, keyword co-occurrence and conceptual proximity do not demonstrate causal relationships, clinical effectiveness, or evidence quality. A frequently occurring topic may still be supported by weak or preliminary research. Fifth, the inclusion of psychotherapy and mental health services broadened retrieval. However, it may also have increased the proportion of studies that are adjacent to, rather than explicitly grounded in, counseling theory and practice.

Finally, thematic-map interpretation is inherently cautious because themes in the low-centrality and low-density quadrant may be either emerging or declining.

CONCLUSION

This study traces the evolution of artificial intelligence in counseling research from 2016 to 2026, drawing on 119 articles retrieved from Scopus and ScienceDirect. Publication output developed gradually through 2022, accelerated after 2023, and reached its highest reported level in 2025, while the 2026 data remain incomplete. The intellectual structure is organized principally around artificial intelligence, mental health, machine learning, natural language processing, digital health, psychotherapy, and common mental health concerns.

The temporal and conceptual analyses indicate a transition from telemedicine and eHealth toward ChatGPT, generative AI, and LLM-based systems. However, counseling-specific theories and professional constructs remain comparatively weak. Counselor competence, counselor education, supervision, therapeutic alliance, multicultural counseling, school counseling, informed consent, professional accountability, and evidence-based outcomes do not yet function as dominant organizers of the field.

The study's principal contribution is therefore not a claim that AI is clinically effective, but a structured account of where research attention is concentrated and where counseling scholarship must develop. Future work should prioritize counselor-supervised AI, explicit human-in-the-loop task boundaries, rigorous evaluation of processes and outcomes, culturally responsive design, school counseling applications, and risk-based ethical governance. Bibliometric prominence reflects scholarly activity; it should never be treated as proof that an AI system can replace professional counseling judgment or relational care.

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