ARTIFICIAL COMPANIONS, AUTHENTIC FEELINGS? EXAMINING THE IMPACT OF CONVERSATIONAL AI ON ADOLESCENT EMPATHY DEVELOPMENT: A LITERATURE REVIEW

Irba Tartila Amtiyaz*, Hani Risnawati[2], Andriani Mei Astuti[3]
Bachelor of Nursing, Duta Bangsa University[1.2.3]
*Correspondence Email : irba_tartila@udb.ac.id

ABSTRACT

This literature review examined whether interaction with conversational artificial intelligence affects empathy development in adolescents aged 10 to 19 years. A narrative synthesis was conducted using searches of PubMed, IEEE Xplore, and Scopus for open-access, peer-reviewed studies published in English or Indonesian between 2010 and 2026. Studies were included when they reported empirical data on adolescents' interaction with a chatbot and measured empathy as an outcome, and findings were organized by empathy type and chatbot type. The evidence did not show that conversational AI develops empathy in adolescents. No study followed adolescent users of general-purpose chatbots over time against a comparison group. The only controlled trial, using a purpose-built training application with a mixed-age sample, found improved verbal empathetic responding after repeated practice with immediate feedback. General-purpose chatbots were consistently perceived as empathic, mainly in cognitive rather than affective terms, but this reflects empathy received rather than developed. Relational use appeared limited to a small, lonelier subgroup, and measurement approaches varied widely. Designed, feedback-rich chatbots may therefore supplement empathic skill practice, but they should not replace human interaction. Future research should use controlled longitudinal designs that measure cognitive and affective empathy separately.

KEYWORDS conversational AI, adolescents, empathy, parasocial attachment, social cognition

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International

INTRODUCTION

Conversational artificial intelligence (AI) is built upon functional interaction goals, a core computational pipeline, and emerging operational capabilities that manage memory, proactive dialogue, and contextual reasoning. The agent for conversational AI is built to imitate human conversations using languange and terms that are spoken or written naturally (Kusal et al., 2022). Conversational agents usually work as a step-by-step pipeline: they take in what the user says, work out what it means, decide how to respond, and then deliver the reply (Allouch et al., 2021; Saka et al., 2023).

The general purpose of conversational AI, along with AI companions are now a big part of everyday life for many individuals, especially teenagers with growing interest in technology. Beside their growing interest in technology, the high usage of conversational AI in adolescent are also driven by entertainment and companionship the technology delivered. A third of teens have chosen AI companions over humans for serious conversations, and a quarter have shared personal information with these platforms (Common Sense Media, 2025). The design to function as digital "friends" or characters can feel personal and meaningful. In a case of teen suicide in 2025, the conversation the adolescent has with AI is characterized as human-like and affirmative, and sometimes also includes agreement with user's negative-suicidal thoughts (Hill, 2025). This case has raises concern about AI safety and the vulnerability of adolescent to emotional reliance when teenager are having one-sided conversation with anthropomorphic AI companion.

Anthropomorphism is attribution of human qualities, onto non-human such as objects, animals, or natural events. This process represents human interpretation to perceive entity as human-like because of its physical features. Within this process, the anthropomorphized object are permeated with mental capacity that are specifically human such as empathy, shame, guilt, and other emotion (Placani, 2024). The Anthropomorphism of conversational AI has lead it's development as companion agent to provide emotional support. Talking to chatbots about negative emotions or stressful experiences may also have benefits over discussing these issues with other humans. Such disclosure to chatbots can have similar emotional, relational and psychological effects as disclosing to another human even when machine experience the emotion itself. But this feature could also help with the user's comfort in using conversational AI. Because chatbots do not think or form judgments on their own, people may feel more comfortable disclosing to a chatbot compared to a person, changing the nature of disclosure and its outcomes (Ho et al., 2018).

While conversational AI can generate expressions of care, ethic concerns are being raised where conversational AI users confuse algorithmic attunement with genuine moral presence. The problem arises because machinery lack lived vulnerability, consciousness, and moral accountability, therefore emotional reliance on the agent could risk emotional substitution and affective dependency. AI can effectively serve as a pedagogical tool for cultivating human empathy, but computational systems remain limited to behavioral simulations that cannot replace conscious, reciprocal human care (K. G. & Joseph, 2025).

This risk is not inevitable, and it can be reduced by strengthening the capacities that AI cannot supply. Empathic and emotional skills, such as recognizing emotions in others, taking another person's perspective, and regulating one's own affective responses, help people distinguish genuine reciprocal care from algorithmic simulation. These skills are largely consolidated during adolescence, which makes the teenage years a strategic window for prevention. When young people build emotional competence through real

relationships, they develop an internal benchmark of what authentic care involves, and they are less likely to mistake computational responsiveness for moral presence.

Adolescence is a critical period for empathy development. During these years, individuals shift from basic emotional contagion toward affective (sophisticated perspective-taking, a capacity that underpins adult social competence) and cognitive (empathic concern and emotional resonance) empathy (Jacob & Reddy, 2025). Cognitive empathy steadily increases from early adolescence into young adulthood, driven by advances in social cognition and executive functions. In contrast, affective empathy develops earlier in childhood and remains relatively stable across adolescence, though it experiences acute vulnerabilities during puberty (Topsfield & Grainger, 2026). Enviromental domain such as peer friendships, maternal caregiving, social norm intervention, and broader community are influencing empathy in adolescent along with digital media use. Peer friendships espesically are influencing adolescent in promoting cognitive perspective-taking and socialization by functioning as an egalitarian training ground where mutual communication, conflict negotiation, and social feedback continuously sharpen mentalizing abilities. Through distinct collaborative, normative, and intergroup processes, close peer relationships socialize adolescents into broader social integration while refining their understanding of other minds (Miklikowska et al., 2022).

Current literature suggests that conversational AI, virtual companions, and digital tools can improve specific components of empathy in teenagers, such as verbal empathic statements, emotion recognition, and short-term affective awareness. However, results are mixed across different empathy domains, and long-term retention remains challenging. This is because conversational agents are programmed to be perpetually available, attentive, and endlessly accommodating, they present an unattainable relationship model that does not mirror real social dynamics. Continuous interaction with an artificial confidant can set unrealistic social expectations, diminishing an adolescent's patience and tolerance for reciprocal peer interactions that involve conflict or disagreement (Sun et al., 2026). Healthy identity consolidation relies on cultural transmission and feedback with real stakes from social groups, whereas AI lacks lived experience and merely mirrors adolescent prompts. Consequently, turning to digital conversationalists can insulate youth from healthy interpersonal friction, reducing the motivation to negotiate complex social boundaries in school and peer environments (Liu & Yip, 2026).

RESEARCH METHOD

This study used a literature review method with a narrative synthesis approach to examine the impact of conversational AI (chatbots) on empathy development in adolescents aged 10 to 19 years. The review was conducted in August 2026 through online database searches, so it required no physical research site. The sources were open-access peer-reviewed journal articles and conference proceedings published in English or Indonesian from January 2010 to August 2026. The databases searched were PubMed (including MEDLINE), IEEE Xplore, and Scopus, with a language filter set to English and Indonesian. The search used the keywords ("chatbot*" OR "conversational agent*" OR "conversational AI" OR "large language model*" OR "AI companion*") AND ("empathy" OR "empathic" OR "perspective-taking" OR "social-emotional development") AND ("adolescen*" OR "teen*" OR "youth"), adapted to each database's syntax. The search identified 118 articles, which were imported into Zotero. After 21 duplicates were removed, 97 articles remained, and 16 non-open-access articles were then excluded, leaving 81 articles. These 81 articles were screened for relevance to the research case, meaning they reported original empirical data on adolescents' interaction with a chatbot and measured

empathy as an outcome. Purely theoretical or opinion pieces, studies of physical robots without a chatbot component, and non-peer-reviewed materials were excluded. This process left 14 articles for the review. From each of these, the following were recorded: the authors, year, country, sample characteristics, chatbot type, empathy measure, and key findings. These data were then analyzed with narrative synthesis, organized by empathy type (cognitive vs. affective) and chatbot type (general-purpose, companion, and therapeutic), to identify patterns, differences, and gaps across studies.

RESULT AND DISCUSSION

The fifteen sources extracted in the review workbook were synthesized against the primary question of whether interaction with conversational AI affects empathy development in adolescents aged 10–19 years, and against the secondary questions on chatbot type, empathy subtype, measurement modality, moderating factors, and proposed mechanisms. Because the workbook holds published findings rather than primary experimental data, the results below are the findings reported by the reviewed studies, and the discussion evaluates what they jointly allow us to conclude.

Characteristics of the Evidence Base

Fourteen of the fifteen sources were published between 2024 and 2026 and one in 2020 (Table 1). The designs range from a preregistered survey of 1,599 Danish high-school students (Herbener & Damholdt, 2025) and qualitative interviews (Ding & Barbic, 2025) to system development studies (Abilkaiyrkyzy *et al.*, 2024; Hanzawa *et al.*, 2026; Kim *et al.*, 2026) and a single randomized controlled trial (Koegel *et al.*, 2026).

Table 1. Sources included in the synthesis, ordered by year of publication

Study	Population / context	Design	Empathy-related content
Ocaña *et al.* (2020)	137 Ecuadorian students, 10–12 years	Single-group pre–post	Companion responds to emotions; outcome is programming score
Abilkaiyrkyzy *et al.* (2024)	20 university students	System development and pilot	Depression screening; usability
Maida *et al.* (2024)	1,133 adults with multiple sclerosis	Cross-sectional survey	Perceived empathy of responses (CARE)
Theophilou *et al.* (2024)	317 students, 12–19 years	Longitudinal pre–post	Social awareness and self-awareness
Herbener & Damholdt (2025)	1,599 Danish high-school students	Cross-sectional survey	No empathy outcome; loneliness and friend-like chatbot use
Pavarini *et al.* (2025)	Brazilian adolescents, 15–18 years	Co-design and acceptability	Empathic listening taught as a peer-support skill
Ding & Barbic (2025)	23 stakeholders (12 youth)	Qualitative interviews	Empathy as acceptance criterion
Laine *et al.* (2025)	99 Korean students, 15–17 years	Development and usability study	Empathy-type assessment in virtual reality
Skjuve *et al.* (2026)	123 youth, 31 professionals	Blind rating study	Validation, relevance, clarity, utility of answers
Hanzawa *et al.* (2026)	6 clinicians; 477 queries	System development	Appropriateness of supportive replies
Kim *et al.* (2026)	Two benchmark interview datasets	Computational study	No empathy outcome

Study	Population / context	Design	Empathy-related content
Chan & Tse (2026)	69 students, 13–17 years	Qualitative reflections	Perceived empathy of AI therapists
Lee *et al.* (2026)	18 raters, 2 counsellors	Dataset and fine-tuning	Empathy and anthropomorphism ratings
Jafarnia *et al.* (2026)	75 chatbot responses	Response evaluation	Perceived empathy (PETS)
Koegel *et al.* (2026)	30 autistic people, 11–35 years	Waitlist randomized trial	Verbal empathetic responses

The central finding is a gap. No study followed adolescent users of a general-purpose conversational agent over time and measured change in their empathy against a comparison group. The only controlled test of empathy change (Koegel *et al.*, 2026) used a purpose-built training application and a sample spanning ages 11 to 35. Elsewhere, empathy appears in three different roles: as a property of chatbot output judged by raters (Maida *et al.*, 2024; Jafarnia *et al.*, 2026; Lee *et al.*, 2026), as a skill trained by a designed application (Koegel *et al.*, 2026; Pavarini *et al.*, 2025), and as a quality users expect from AI (Chan & Tse, 2026; Ding & Barbic, 2025). This pattern is understandable because many studies aimed at feasibility, acceptability, or technical performance, and in such designs empathy is easier to score in the chatbot's text than to track in the user's development. As a result, the primary question cannot be answered directly and must be approached through the indirect lines of evidence below.

Purpose-Built Chatbots Can Train Empathic Responding, but the Evidence Is Narrow

The strongest evidence of change in a user comes from the waitlist trial of the Noora application (Koegel *et al.*, 2026). Accuracy of empathetic responses in a live conversation with a human partner rose from 16.67% to 50.94% in the intervention group, whereas the waitlist group moved from 28.87% to 31.40% (Figure 1). Mean gains were 37.67% versus 2.53% ($U = 35.0$, $p < 0.01$, effect size 0.62), and within the application 10 of 14 participants (71%) improved, by 13.2% on average.

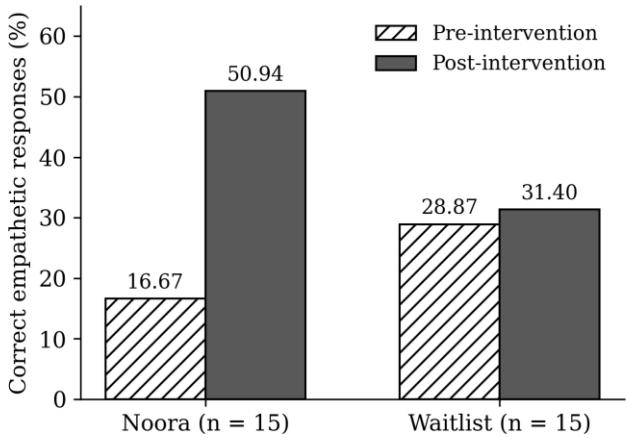


Figure 1. Accuracy of empathetic responses in the conversation probe before and after the intervention (data from Koegel *et al.*, 2026).

Two design features plausibly explain why this chatbot worked. First, it automated an established behavioral training method: participants completed at least 10 trials a day,

five days a week, for about four weeks, received immediate feedback, and saw verified model answers when they erred. Second, the domain was closed, with about 330 pre-written statements and a toxicity filter, so the feedback was consistent. That the gain appeared in a conversation with a person, not only inside the application, suggests the practiced skill transferred. Several caveats limit the finding. A waitlist control cannot separate the effect of the chatbot from the effect of structured practice and attention. Human raters agreed with the application's grading 85% of the time, about a third of participants made only small gains, and the outcome was verbal empathetic responding, which is an expressed skill and not felt affective empathy. The participants were also conversational autistic people, so generalization to typical adolescents is untested.

Two adolescent studies with designed conversational elements point in the same direction with weaker evidence. Theophilou *et al.* (2024), who embedded a chatbot in a simulated social media platform, found a significant pre–post improvement in overall self-protection skills (mean 59.4 to 60.7, $p < 0.05$), driven by responsible decision-making, social awareness, and self-awareness, but not by social media literacy. The change was small, the design had no true control group, and gains were not significant in the 4° ESO group ($n = 36$), which the authors attribute to low power. Pavarini *et al.* (2025) reported high self-rated motivation and preparedness to help peers (means 4.20–4.54 on 1–5 scales) after a scripted chat-story that taught empathic listening, but these data came from optional post-only respondents (about 20% response) and cannot show change. The smaller effect in Theophilou *et al.* than in Koegel *et al.* is consistent with differences in dosage (four monthly sessions of about 90 minutes versus near-daily practice), target (broad self-protection versus a specific empathic response), and rigor of design. Taken together, these studies suggest that designed, feedback-rich interactions, not open-ended chat, are the setting in which empathy-related change has been observed.

Chatbot Responses Are Perceived as Empathic, Mostly in Cognitive Terms

A consistent result across the sources is that raters find chatbot text empathic. In a multiple sclerosis sample, ChatGPT responses received higher CARE empathy scores than neurologists' responses (coefficient 1.38; 95% CI 0.65–2.11; $p < 0.01$), although overall satisfaction did not differ ($p = 0.157$), and college-educated respondents were less likely to prefer ChatGPT (IRR = 0.87) (Maida *et al.*, 2024). Young people rated ChatGPT answers higher than professional answers for relevance and utility, and 52% recommended a ChatGPT answer against 19% for professional answers, while professionals showed no preference and reported problems more often (84% versus 49%) (Skjuve *et al.*, 2026). Among adolescent and young adult melanoma questions, understanding-and-trust empathy (PETS-UT) exceeded emotional responsiveness (PETS-ER) for all three chatbots, with the highest means for ChatGPT (6.36 and 5.35) (Jafarnia *et al.*, 2026).

The gap between PETS-UT and PETS-ER is informative for the question of empathy subtype. Text-only systems can signal understanding by validating, restating, and tailoring a reply, which fits the personal-focus and tone dimensions of Media Richness Theory used by Skjuve *et al.* (2026), but they cannot show emotional engagement through nonverbal cues, a limitation also noted by Abilkaiyrkyzy *et al.* (2024). We therefore interpret the cognitive advantage as a property of the medium, although none of the studies tested this explanation directly. Readability adds a further concern for young users: the responses averaged a Flesch-Kincaid grade level of 11.82, above the eighth-grade benchmark, and more readable answers tended to score higher in quality and empathy (Jafarnia *et al.*, 2026).

Adolescents' own views are divided. Of 69 Hong Kong students, 18 supported AI as a therapist, 28 opposed it, 16 would use it only for trivial matters or venting, 5 were uncertain, and 2 gave no position, and some anthropomorphized the system, which the

authors describe as a therapeutic misconception (Chan & Tse, 2026). Stakeholders in Canada likewise treated convincing human-like empathy as the standard for acceptance while worrying about crisis handling and privacy (Ding & Barbic, 2025). This tension is technically addressable in either direction. Fine-tuning on an empathy dataset raised human-rated empathy and coherence by more than 1.0 point on a 0–3 scale and cut expert-rated anthropomorphism from 2.00 to 0.67 and 0.75 for two models, and toxicity from 1.83 and 1.75 to 0.33 and 0.25 (Lee *et al.*, 2026). Thus a chatbot can be rated as more empathic and less human-like at once, although the raters in that study were adults. A key implication is that perceived empathy in chatbot output is empathy received by the user, not empathy developed by the user, and the reviewed studies do not show that the first leads to the second.

Use Patterns, Moderators, and Measurement

Evidence on how adolescents actually use chatbots suggests that relational use is limited. In the Danish survey, 14.6% reported friend-like conversations, but most who described their use (n = 174) described utilitarian purposes, and only the social-supportive subgroup (n = 39; 2.44% of the sample) was lonelier (d = 0.53) and perceived less support (d = −0.46) than non-users (Herbener & Damholdt, 2025). Loneliness predicted situational triggers such as bad mood or wanting to share feelings, but not chat frequency or a sense of friendship, and the authors interpret chatbots as coping tools rather than companions. This agrees with earlier reports that chatbot relationships can resemble human ones and that Replika users tend to be lonelier, but only for a small subgroup. Because the data are cross-sectional and the subgroup small, they cannot test whether chatbot use compensates for or displaces human contact, so this question remains contested.

Evidence on moderators is thin (Table 2 summarizes how empathy-related outcomes were measured). Younger students rated a narrative intervention more favorably than older ones (Theophilou *et al.*, 2024), education level shaped preference for AI answers among adults (Maida *et al.*, 2024), and no gender or prior-experience effects on usability appeared in a virtual reality study (Laine *et al.*, 2025). No study related usage frequency or duration, parasocial attachment, or prior social skills to an empathy outcome, and Koegel *et al.* (2026) did not examine the relation between usage and gain.

Table 2. Measurement modalities used for empathy-related outcomes in the reviewed studies

Measurement modality	Instrument or method	Studies	What it captures and its limit
Rater judgment of chatbot text	CARE; PETS-ER and PETS-UT; 0–3 rating scales	Maida *et al.*; Jafarnia *et al.*; Lee *et al.*	Empathy perceived in the output; says nothing about change in the user
Behavioral probe	Scored 20-minute conversation with a human partner	Koegel *et al.*	Empathic responding in real conversation; expressive skill only, narrow sample
Self-reported competence	Ad hoc social media self-protection questionnaire	Theophilou *et al.*	Perceived socio-emotional skills; not validated as a whole
Immersive scenario test	VR empathy-type test (multidimensional scale)	Laine *et al.*	Empathy type in situated scenarios; validity tested elsewhere
Qualitative accounts	Thematic analysis of reflections and interviews	Chan & Tse; Ding & Barbic	Attitudes and expectations; not outcomes

Measurement heterogeneity itself limits comparison. Perceived-empathy scales rate text, a behavioral probe rates expressed skill, and a self-report questionnaire rates perceived

competence, so effect sizes are not commensurable across these studies. The immersive test of Laine *et al.* (2025) offers a situated alternative that captures multidimensional empathy types, with a usability score of 65.76, although 17.2% of adolescents reported cybersickness and the validity of its results was tested separately.

On the primary question, the reviewed evidence does not show that conversational AI interaction develops empathy in adolescents. It supports a narrower, conditional statement: purpose-built chatbots that give repeated practice with immediate, verified feedback can improve verbal empathetic responding, as shown in one randomized trial with a mixed-age sample, whereas general-purpose chatbots are widely perceived as empathic without any evidence yet that this changes the empathy of young users. On the secondary questions, the evidence favors designed skill-training and narrative chatbots over open-ended ones, indicates that the empathy conveyed by chatbots is stronger in its cognitive than in its affective form, and identifies behavioral feedback training, narrative and authentic learning, and media richness as the proposed mechanisms. The moderating role of use frequency, attachment, prior social skills, and gender remains untested.

These findings define the gap that a new study can address: a controlled, longitudinal design in adolescents that compares a general-purpose chatbot with a feedback-based training chatbot, measures cognitive and affective empathy separately with a behavioral outcome as well as self-report, and records usage and attachment as moderators. The synthesis has its own limits, since it relies on the data extracted into the workbook, mixes populations from children to adults, and includes several studies where empathy was not the main outcome.

CONCLUSION

This review set out to determine whether interaction with conversational AI affects empathy development in adolescents aged 10–19 years. The evidence in the 15 reviewed sources does not show that it does. No study followed adolescent users of a general-purpose chatbot over time and measured change in their empathy against a comparison group. The only controlled test of empathy change, a randomized trial of the Noora application, found that four weeks of repeated practice with immediate feedback raised empathetic responding in live conversation from 16.67% to 50.94%, against 28.87% to 31.40% in the waitlist group. That trial used a purpose-built training tool and a sample aged 11 to 35, so it supports a conditional claim only: designed, feedback-rich chatbots can train verbal empathetic responding, while open-ended chatbots have not been shown to change the empathy of young users.

Chatbots are consistently perceived as empathic, but mainly in a cognitive sense (signaling understanding) more than an affective one (emotional responsiveness), and this is empathy received rather than empathy developed. Relational use of chatbots among adolescents appears limited to a small, lonelier subgroup, and the effects of use frequency, attachment, prior social skills, and gender remain untested. Measurement also differs widely across studies, so results are hard to compare. Future research should therefore use controlled longitudinal designs in adolescents, compare general-purpose with feedback-based chatbots, measure cognitive and affective empathy separately with behavioral as well as self-report outcomes, and record usage and attachment as moderators. Until such evidence exists, chatbots are best treated as supplementary tools for practicing empathic skills, not as replacements for human interaction.

REFERENCES

Abilkaiyrkyzy, A., Laamarti, F., Hamdi, M., & El Saddik, A. (2024). Dialogue system for early mental illness detection: Toward a digital twin solution. IEEE Access, 12, 2007–2024. https://doi.org/10.1109/ACCESS.2023.3348783

Allouch, M., Azaria, A., & Azoulay, R. (2021). Conversational Agents: Goals, Technologies, Vision and Challenges. Sensors, 21(24), 8448. https://doi.org/10.3390/s21248448

Chan, C. K. Y., & Tse, S. (2026). Exploring student perceptions of generative AI therapists and their benefits and challenges in schools. International Journal of Psychology, 61, Article e70207. https://doi.org/10.1002/ijop.70207

Common Sense Media. (2025, July 16). Talk, Trust, and Trade-Offs: How and Why Teens Use AI Companions. https://www.commonsensemedia.org/research/talk-trust-and-trade-offs-how-and-why-teens-use-ai-companions

Ding, X., & Barbic, S. (2025). Perception of AI use in youth mental health services: Qualitative study. Journal of Participatory Medicine, 17, Article e69449. https://doi.org/10.2196/69449

Hanzawa, M., Hasei, J., Okada, A., Tanaka, C., Shigeyasu, Y., Fujii, C., Horiuchi, M., Sugihara, A., Takeuchi, K., Nakahara, R., Katayama, H., Takahashi, Y., Ozaki, T., & Tsukahara, H. (2026). Development of a generative AI agent for family support in implementing family-based treatment for children and adolescents with anorexia nervosa. Frontiers in Digital Health, 8, Article 1759690. https://doi.org/10.3389/fdgth.2026.1759690

Herbener, A. B., & Damholdt, M. F. (2025). Are lonely youngsters turning to chatbots for companionship? The relationship between chatbot usage and social connectedness in Danish high-school students. International Journal of Human-Computer Studies, 196, 103409. https://doi.org/10.1016/j.ijhcs.2024.103409

Hill, K. (2025, August 26). A Teen Was Suicidal. ChatGPT Was the Friend He Confided In. The New York Times. https://www.nytimes.com/2025/08/26/technology/chatgpt-openai-suicide.html

Ho, A., Miner, A. S., & Hancock, J. (2018). Psychological, Relational, and Emotional Effects of Self-Disclosure After Conversations With a Chatbot |. Journal of Communication, 68(4), 712–733. https://doi.org/https://doi.org/10.1093/joc/jqy026

Jafarnia, J. L., Haff, P. L., Moore, R. P., Osheim, A. L., Riley, K. M., Zheng, S., Roth, M., Salge, M. H., & Nelson, K. C. (2026). Quality, empathy, and readability of AI chatbot responses to the survivorship needs of adolescents and young adults with melanoma: Evaluation study. JMIR Cancer, 12, Article e84234. https://doi.org/10.2196/84234

K. G., A., & Joseph, J. (2025). The compassion illusion: Can artificial empathy ever be emotionally authentic? Frontiers in Psychology, 16. https://doi.org/10.3389/fpsyg.2025.1723149

Kim, J.-W., Yoon, H., Jung, D., Oh, W., Choi, D., Yoon, S.-H., Kim, D.-J., Lee, S.-Y., Kim, B.-N., & Yang, C.-M. (2026). DSM-Guided Large Language Model Reasoning for Depression and PTSD Assessment From Psychiatric Interview Transcripts. IEEE Access, 1–1. https://doi.org/10.1109/ACCESS.2026.3727881

Koegel, L. K., Ponder, E., Bruzzese, T., Wang, M., Semnani, S. J., Chi, N., Koegel, B. L., Lin, T. Y., Swarnakar, A., & Lam, M. S. (2026). Using Artificial Intelligence

to Improve Empathetic Statements in Autistic Adolescents and Adults: A Randomized Clinical Trial. Journal of Autism and Developmental Disorders, 56(7), 2513–2529. https://doi.org/10.1007/s10803-025-06734-x

Kusal, S., Patil, S., Choudrie, J., Kotecha, K., Mishra, S., & Abraham, A. (2022). AI-Based Conversational Agents: A Scoping Review From Technologies to Future Directions. IEEE Access, 10, 92337–92356. https://doi.org/10.1109/ACCESS.2022.3201144

Laine, T. H., Lee, W., Moon, J., Hasanov, A., & Suk, H. J. (2025). Scenario-based immersive virtual reality platform for testing empathy types: A development study. IEEE Access, 13, 183242–183261. https://doi.org/10.1109/ACCESS.2025.3624300

Lee, H. J., Lee, S., Kim, H., Park, S., & Cho, S. (2026). OSED-Ko: Open-source empathy-driven dialogue dataset for emotional support of marginalized populations in South Korea. IEEE Access, 14, 99910–99928. https://doi.org/10.1109/ACCESS.2026.3707234

Liu, C. H., & Yip, T. (2026). AI and Teen Identity Formation. Pediatrics, 158(3), e2026076609. https://doi.org/10.1542/peds.2026-076609

Maida, E., Moccia, M., Palladino, R., Borriello, G., Affinito, G., Clerico, M., Repice, A. M., Di Sapio, A., Iodice, R., Spiezia, A. L., Sparaco, M., Miele, G., Bile, F., Scandurra, C., Ferraro, D., Stromillo, M. L., Docimo, R., De Martino, A., Mancinelli, L., … Digital Technologies, Web, Social Media Study Group of the Italian Society of Neurology (SIN). (2024). ChatGPT vs. neurologists: A cross-sectional study investigating preference, satisfaction ratings and perceived empathy in responses among people living with multiple sclerosis. Journal of Neurology, 271(7), 4057–4066. https://doi.org/10.1007/s00415-024-12328-x

Miklikowska, M., Tilton-Weaver, L., & Burk, W. J. (2022). With a little help from my empathic friends: The role of peers in the development of empathy in adolescence. Developmental Psychology, 58(6), 1156–1162. https://doi.org/10.1037/dev0001347

Ocaña, J. M., Morales-Urrutia, E. K., Pérez-Marín, D., & Pizarro, C. (2020). Can a Learning Companion Be Used to Continue Teaching Programming to Children Even During the COVID-19 Pandemic? IEEE Access, 8, 157840–157861. https://doi.org/10.1109/ACCESS.2020.3020007

Pavarini, G., Murta, S. G., Mendes, J. A. A., Siston, F. R., et al., Talk2U, & Singh, I. (2025). Cadê o Kauê? Co-design and acceptability testing of a chat-story aimed at enhancing youth participation in the promotion of mental health in Brazil. Journal of Child Psychology and Psychiatry, 66(5), 697–715.

Placani, A. (2024). Anthropomorphism in AI: Hype and fallacy. AI and Ethics, 4(3), 691–698. https://doi.org/10.1007/s43681-024-00419-4

Saka, A. B., Oyedele, L. O., Akanbi, L. A., Ganiyu, S. A., Chan, D. W. M., & Bello, S. A. (2023). Conversational artificial intelligence in the AEC industry: A review of present status, challenges and opportunities. Advanced Engineering Informatics, 55, 101869. https://doi.org/10.1016/j.aei.2022.101869

Skjuve, M., Følstad, A., & Brandtzaeg, P. B. (2026). ChatGPT as a mental health advisory service: Comparing evaluations from youth and health professionals. Digital Health, 12, 1–16.

Sun, X., Wang, Y., & McDaniel, B. T. (2026). AI companions and adolescent social relationships: Benefits, risks, and bidirectional influences. Child Development Perspectives, 20(2), 91–98. https://doi.org/10.1093/cdpers/aadaf009

Theophilou, E., Lobo-Quintero, R., Hernández-Leo, D., Sánchez-Reina, R., & Ognibene, D. (2024). Embedding educational narrative scripts in a social media environment. IEEE Transactions on Learning Technologies, 17, 1780–1793. https://doi.org/10.1109/TLT.2024.3409063

Topsfield, A. J., & Grainger, S. A. (2026). Emotional Valence Influences Empathic Capacity in Adolescence and Young Adulthood. Journal of Adolescence, n/a(n/a). https://doi.org/10.1002/jad.70216