

EFEKTIVITAS CHATBOT AI DIBANDINGKAN LAYANAN KONSELOR MANUSIA DALAM DUKUNGAN KESEHATAN MENTAL

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Abstrak. Chatbot berbasis Artificial Intelligence (AI) digunakan sebagai media pendukung kesehatan mental karena mudah diakses, bersifat anonim, dan responsif. Penelitian ini bertujuan menganalisis kualitas chatbot berbasis AI dalam mendukung layanan kesehatan mental menggunakan metode Grounded Theory Literature Review (GTLR). Hasil kajian menunjukkan bahwa kualitas chatbot ditentukan oleh kemampuan empatik, konsistensi respons, akurasi konten, dan personalisasi interaksi. Chatbot efektif sebagai pendukung awal dalam membantu stres dan kecemasan, namun belum mampu menggantikan peran tenaga profesional. Oleh karena itu, chatbot lebih tepat berperan sebagai pelengkap layanan kesehatan mental berbasis digital.

Abstract. AI-based chatbots are used as supporting tools for mental health services due to their accessibility, anonymity, and responsiveness. This study aims to analyze the quality of AI-based chatbots in supporting mental health using the Grounded Theory Literature Review (GTLR) method. The results show that chatbot quality is determined by empathic ability, response consistency, content accuracy, and interaction personalization. Chatbots are effective as early support for stress and anxiety but cannot replace professional mental health services. Therefore, AI-based chatbots are best positioned as complementary tools in digital mental health care.

1. PENDAHULUAN

Pemanfaatan chatbot berbasis AI dalam bidang kesehatan mental berkembang pesat seiring meningkatnya kebutuhan layanan psikologis yang mudah diakses. Berbagai penelitian menunjukkan bahwa chatbot mampu memberikan dukungan awal bagi individu yang mengalami stres, kecemasan, dan gangguan emosi ringan. Chatbot digunakan sebagai media interaksi berbasis teks yang mampu merespons pengguna secara cepat dan berkelanjutan, sehingga dinilai efektif sebagai pendamping awal dalam kesehatan mental.

Chatbot dalam kesehatan mental umumnya dibangun dengan pendekatan Natural Language

Processing (NLP) dan teknik kecerdasan buatan modern. Beberapa sistem mengadopsi pendekatan Therapeutic Communication, seperti Cognitive Behavioral Therapy (CBT) dan mindfulness digital. Selain itu, teori interaksi manusia dan komputer (Human-Computer Interaction) menjadi dasar dalam menilai kualitas pengalaman pengguna terhadap chatbot. Penelitian ini bertujuan untuk menganalisis kualitas chatbot berbasis AI dalam mendukung kesehatan mental berdasarkan kajian literatur terkini, serta mengkaji peran chatbot sebagai pendukung awal layanan psikologis.

2. TINJAUAN PUSTAKA

2.1 Konsep Chatbot dalam Kesehatan Mental

Chatbot kesehatan mental adalah sistem berbasis percakapan yang dirancang untuk memberikan dukungan psikologis awal melalui interaksi teks secara otomatis. Chatbot berfungsi sebagai media pendamping yang membantu pengguna mengekspresikan emosi, mengelola stres, serta memperoleh informasi dasar terkait kesehatan mental.

2.2 Teori Komunikasi Terapeutik

Komunikasi terapeutik menjadi dasar utama dalam interaksi chatbot kesehatan mental. Teori ini menekankan pentingnya empati, respons yang tidak menghakimi, serta kemampuan mendengarkan secara aktif agar pengguna merasa aman dan nyaman dalam berinteraksi.

2.3 Natural Language Processing (NLP)

NLP berperan sebagai teknologi utama yang memungkinkan chatbot memahami bahasa alami pengguna dan menghasilkan respons yang relevan. Model NLP modern seperti GPT, BERT, dan T5 meningkatkan kualitas chatbot dalam memahami konteks percakapan secara lebih natural.

3. METODE PENELITIAN

Penelitian ini menggunakan pendekatan Grounded Theory Literature Review (GTLR) untuk membangun pemahaman konseptual mengenai kualitas chatbot berbasis AI dalam bidang kesehatan mental. Proses GTLR dilakukan melalui empat tahapan utama, yaitu penentuan fokus penelitian, pengumpulan artikel relevan, proses pengodean tematik, serta sintesis temuan menjadi kategori konseptual. Pendekatan ini memungkinkan peneliti menafsirkan pola kualitas chatbot berdasarkan pemaknaan yang muncul dari literatur, bukan dari pengujian statistik.

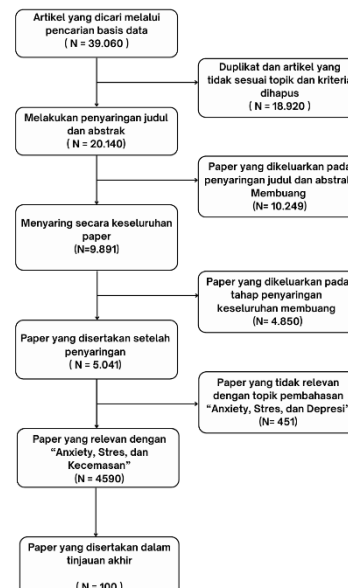
3.1 Kriteria Seleksi

Kriteria inklusi mencakup artikel ilmiah yang membahas chatbot berbasis AI, penerapannya dalam kesehatan mental, serta studi mengenai kualitas interaksi, respons emosional, atau pengalaman pengguna. Artikel yang dipilih harus relevan dengan topik

dukungan psikologis berbasis teknologi dan ditulis dalam konteks penelitian akademik.

Kriteria eksklusi meliputi artikel yang hanya membahas chatbot secara umum tanpa konteks kesehatan mental, artikel yang tidak menjelaskan aspek kualitas atau interaksi, serta publikasi yang tidak memiliki kejelasan metode penelitian. Seleksi ini bertujuan untuk memastikan bahwa artikel yang dianalisis benar-benar merepresentasikan kualitas chatbot dalam konteks kesehatan mental.

3.2 Strategi Pencarian Data dan Seleksi Artikel



Pencarian data dilakukan melalui database ilmiah seperti Google Scholar dan jurnal nasional maupun internasional dengan kata kunci "mental health chatbot", "AI chatbot", dan "digital mental health support". Proses seleksi dilakukan secara bertahap, dimulai dari identifikasi artikel berdasarkan judul, penyaringan abstrak, hingga telaah isi secara menyeluruh. Alur proses ini divisualisasikan dalam bentuk diagram alur seleksi artikel, yang menunjukkan tahapan identifikasi, skrining, kelayakan, dan inklusi artikel sebagai dasar analisis

3.3 Teknik Analisis Data

Teknik analisis data dilakukan secara kualitatif melalui pengodean tematik, yaitu

mengelompokkan temuan penelitian ke dalam tema-tema utama seperti kualitas empati chatbot, konsistensi respons, personalisasi interaksi, serta peran chatbot sebagai pendukung awal kesehatan mental.

4. HASIL DAN PEMBAHASAN

4.1 Hasil Analisis

Hasil analisis menunjukkan bahwa kualitas chatbot kesehatan mental tidak hanya ditentukan oleh kecanggihan teknologi, tetapi juga oleh kemampuan sistem dalam membangun interaksi yang empatik, stabil, dan relevan dengan kondisi psikologis pengguna.

4.1.1 Berdasarkan Tahun

Tahun	Reference	Jumlah
2021	[1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [14]	11
2022	[11], [12], [13], [15], [16], [17], [18]	7
2023	[19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [50], [102], [103]	21
2024	[37], [38], [39], [40], [42], [43], [44], [45], [46], [47], [48], [49], [51], [52], [53], [54], [55], [56], [57], [58], [68], [101]	21
2025	[41], [59], [60], [61], [62], [63], [64], [65], [66], [67], [69], [70], [71], [72], [73], [74], [75], [76], [77], [78], [79], [80], [81], [82], [83], [84], [85], [86], [87], [88], [89], [90], [91], [92], [93], [94], [104]	43

Berdasarkan pengelompokan tahun publikasi, terlihat bahwa pengembangan

chatbot kesehatan mental mengalami pergeseran dari sistem berbasis aturan menuju model berbasis machine learning dan NLP modern. Pada periode awal, chatbot lebih bersifat informatif dan kaku, sedangkan pada periode terbaru, chatbot menunjukkan kualitas yang lebih baik dalam memahami konteks emosi, memberikan respons adaptif, serta menghadirkan percakapan yang lebih natural. Pergeseran ini menunjukkan peningkatan kualitas teknologi sekaligus kualitas pengalaman pengguna.

4.1.2 Berdasarkan Domain

Domain	Reference	Jumlah
Teknologi Digital untuk Intervensi Kesehatan Mental	[54], [53], [49], [8], [17], [27], [35], [23], [66], [72], [71], [83], [95], [98], [68], [14], [50], [104]	18
Dampak Psikologis dan Sosial Penggunaan Chatbot/AI	[42], [3], [25], [31], [22], [69], [70], [74], [79], [84], [12], [102]	12
Penerapan AI untuk Deteksi Dini dan Edukasi	[48], [6], [13], [11], [19], [64], [75], [85], [96]	9
Chatbot sebagai Media Intervensi Psikologis	[9], [18], [20], [26], [34], [73], [76], [59], [87], [88], [61]	11
Efektivitas Chatbot/AI dalam Mengurangi Stres, Depresi, dan Kecemasan	[39], [57], [58], [37], [47], [33], [44], [4], [5],	22

	[15], [16], [30], [21], [67], [80], [81], [82], [86], [91], [97], [99], [2]	
Desain, Fitur, dan Inovasi Chatbot AI	[40], [52], [6], [10], [29], [24], [65], [94], [101], [103]	10
Tantangan, Etika, dan Keamanan dalam Chatbot AI untuk Kesehatan Mental	[55], [45], [43], [7], [60], [78], [89], [92], [93], [100], [28]	11
Studi Kasus, Implementasi Lokal, dan Aplikasi Spesifik	[56], [38], [51], [46], [1], [28], [36], [63], [77], [41], [62]	11

Berdasarkan domain penerapan, chatbot kesehatan mental digunakan pada domain stres, kecemasan, depresi ringan, dan kesejahteraan mental umum. Pada domain stres dan kecemasan, chatbot dinilai mampu memberikan dukungan emosional awal secara konsisten. Pada domain depresi ringan, chatbot lebih efektif sebagai pendamping reflektif melalui percakapan terstruktur. Hal ini menunjukkan bahwa kualitas chatbot sangat dipengaruhi oleh kesesuaian antara domain masalah dan pola interaksi yang dibangun.

4.1.3 Berdasarkan Metode Penelitian

Metode Penelitian	Reference	Jumlah
Kuantitatif	[9], [4], [2], [10], [15], [11], [20], [22], [25], [29], [30], [32], [34], [41], [42], [61],	20

	[96], [97], [80], [102]	
Kualitatif	[1], [18], [31], [40], [46], [70], [71], [72], [73], [74], [76], [77], [98], [100], [95], [94], [81], [83], [86], [66], [26]	21
Mix Method	[5], [12], [16], [14], [36], [28], [27], [19], [43], [59], [62], [63], [69], [85], [87], [88], [90]	17
Expert Review	[8]	1
Scoping Review	[7], [17], [23], [24], [39], [48], [53], [54], [67], [84], [89], [93]	12
Narrative Review	[6], [13], [45], [52], [55], [103]	6
Pengembangan sistem / eksperimen komputasional (AI model development)	[3], [82], [79], [64], [65], [68]	6
Systematic review dan meta-analysis	[21], [35], [33], [99], [91]	5
Randomized Controlled Trial (RCT)	[37], [38], [44], [57], [47], [50]	6
Eksperimen evaluatif	[56], [60], [78]	3
Eksperimen Kuantitatif	[58], [75], [92], [104]	4
Literature Review	[51]	1
Systematic Literature Review (SLR)	[49], [101]	2

Berdasarkan metode penelitian, kualitas chatbot dianalisis melalui pendekatan

eksperimen sistem, studi literatur, dan evaluasi pengalaman pengguna. Studi eksperimen menekankan kualitas teknis dan performa sistem, sementara evaluasi pengguna lebih menyoroti kualitas empati, kenyamanan interaksi, serta tingkat kepercayaan terhadap chatbot. Hasil sintesis menunjukkan bahwa kualitas chatbot yang baik harus mampu menyeimbangkan aspek teknis dan pengalaman emosional pengguna.

4.1.4 Berdasarkan Sasaran Penelitian

Sasaran Penelitian	Reference	Jumlah
Mahasiswa/Remaja	[61], [62], [99], [97], [95], [94], [93], [92], [91], [89], [88], [87], [86], [59], [84], [85], [77], [80], [75], [76], [74], [71], [72], [70], [69], [68], [64], [63], [40], [57], [58], [38], [37], [52], [51], [48], [49], [1], [2], [3], [4], [5], [7], [9], [10], [11], [12], [14], [15], [16], [18], [19], [22], [23], [25], [28], [31], [102], [101], [104]	61
Pasien (Umum)	[100], [98], [96], [83], [81], [78],	17

	[66], [65], [39], [56], [54], [55], [53], [20], [24], [29], [30]	
Pasien (Khusus)	[41], [60], [33], [34], [44], [47], [50]	7
Tenaga Kesehatan	[90], [82], [8], [13], [21], [43]	6
Masyarakat Umum	[79], [73], [17], [25], [27], [32], [35], [36], [42], [45], [46], [67], [103]	13

Berdasarkan sasaran pengguna, chatbot kesehatan mental banyak ditujukan untuk mahasiswa, remaja, dan masyarakat umum. Pada mahasiswa, chatbot berperan sebagai pendamping dalam mengelola tekanan akademik. Pada remaja, chatbot berfungsi sebagai ruang ekspresi yang aman dan anonim. Sementara pada masyarakat umum, chatbot menjadi media dukungan awal yang mudah diakses. Perbedaan sasaran ini menunjukkan bahwa kualitas chatbot harus disesuaikan dengan karakteristik psikologis penggunanya.

4.2 Hasil Discussion

Menurut Radhiya Sabila dkk. (2024), kualitas penerimaan virtual assistant chatbot sangat ditentukan oleh kepercayaan pengguna dan pengaruh sosial, yang menunjukkan bahwa mutu interaksi dan kredibilitas sistem menjadi faktor utama dalam membangun niat penggunaan. Selanjutnya, menurut Nidhi Suryono dkk. (2023), ChatGPT terbukti mampu meningkatkan produktivitas mahasiswa, terutama dalam memahami materi dan menyelesaikan tugas, namun kualitas

jawaban yang akurat dan relevan tetap menjadi tuntutan utama. Sementara itu, menurut Tri Lathif (2023), perkembangan model NLP modern seperti GPT, BERT, dan T5 meningkatkan kualitas chatbot dalam memahami konteks bahasa dan menghasilkan respons yang lebih natural, meskipun masih menghadapi tantangan etika dan bias.

Secara keseluruhan, pembahasan menunjukkan bahwa kualitas chatbot kesehatan mental terletak pada kemampuan empati digital, konsistensi respons, akurasi konten psikologis, serta kemampuan adaptasi terhadap kebutuhan pengguna. Meskipun chatbot belum mampu memahami kompleksitas emosi secara mendalam, sistem ini tetap efektif sebagai pendukung awal kesehatan mental yang bersifat preventif dan edukatif.

5. KESIMPULAN

5.1 Kesimpulan

- Kualitas interaksi chatbot: Chatbot berbasis AI terbukti mampu menyediakan interaksi yang empatik, stabil, dan responsif, sehingga efektif digunakan sebagai media pendukung kesehatan mental pada tahap awal.
- Aksesibilitas dan kenyamanan layanan: Chatbot memiliki keunggulan dalam kemudahan akses, anonimitas, dan ketersediaan layanan yang berkelanjutan, sehingga meningkatkan kenyamanan pengguna dalam mencari bantuan psikologis.
- Peran sebagai pelengkap, bukan pengganti: Meskipun memiliki kualitas yang baik, chatbot belum mampu menggantikan peran tenaga profesional dalam menangani kondisi mental yang kompleks, sehingga lebih tepat diposisikan sebagai pelengkap layanan psikologis.

5.2 Saran



- Peningkatan sensitivitas emosi pengguna: Chatbot perlu dikembangkan agar lebih peka terhadap konteks emosi dan kondisi psikologis pengguna untuk meningkatkan kualitas respons.
- Penguatan personalisasi percakapan: Pengembangan fitur personalisasi diperlukan agar interaksi chatbot lebih sesuai dengan kebutuhan dan karakteristik masing-masing pengguna.
- Penguatan aspek etika dan keamanan data: Perlindungan data pribadi dan transparansi penggunaan sistem harus menjadi prioritas utama dalam pengembangan chatbot kesehatan mental.
- Integrasi dengan tenaga profesional: Chatbot sebaiknya diintegrasikan dengan layanan psikolog atau konselor agar dapat berfungsi sebagai sistem rujukan ketika pengguna berada dalam kondisi berisiko.

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DAFTAR PUSTAKA

- [1] C. Grové, "Co-developing a Mental Health and Wellbeing Chatbot With and for Young People," *Front Psychiatry*, vol. 11, Feb. 2021, doi: 10.3389/fpsyt.2020.606041.
- [2] S. Gabrielli *et al.*, "Engagement and effectiveness of a healthy-coping intervention via chatbot for university students during the COVID-19 pandemic: Mixed methods proof-of-concept study," *JMIR Mhealth Uhealth*, vol. 9, no. 5, May 2021, doi: 10.2196/27965.
- [3] I. Salhi, K. El Guemmat, M. Qbadou, and K. Mansouri, "Towards developing a pocket therapist: An intelligent adaptive psychological support chatbot against mental health disorders in a pandemic situation," *Indonesian Journal of Electrical Engineering and Computer Science*, vol. 23, no. 2, pp. 1200–1211, Aug. 2021, doi: 10.11591/ijeecs.v23.i2.pp1200-1211.
- [4] A. P. C. Lin, C. V. Trappey, C. C. Luan, A. J. C. Trappey, and K. L. K. Tu, "A test platform for managing school stress using a virtual reality group chatbot counseling system," *Applied Sciences (Switzerland)*, vol. 11, no. 19, Oct. 2021, doi: 10.3390/app11199071.
- [5] L. Maenhout, C. Peuters, G. Cardon, S. Compennolle, G. Crombez, and A. DeSmet, "Participatory Development and Pilot Testing of an Adolescent Health Promotion Chatbot," *Front Public Health*, vol. 9, Nov. 2021, doi: 10.3389/fpubh.2021.724779.
- [6] J. Torous *et al.*, "The growing field of digital psychiatry: current evidence and the future of apps, social media, chatbots, and virtual reality," *World Psychiatry*, vol. 20, no. 3, pp. 318–335, Oct. 2021, doi: 10.1002/wps.20883.
- [7] B. Wies, C. Landers, and M. Ienca, "Digital Mental Health for Young People: A Scoping Review of Ethical Promises and Challenges," Sep. 06, 2021, *Frontiers Media SA*. doi: 10.3389/fdgth.2021.697072.
- [8] E. M. Boucher *et al.*, "Artificially intelligent chatbots in digital mental health interventions: a review," *Expert Rev Med Devices*, vol. 18, no. suppl, pp. 37–49, 2021, doi: 10.1080/17434440.2021.2013200.
- [9] E. L. Matheson *et al.*, "Improving body image at scale among Brazilian adolescents: study protocol for the co-creation and randomised trial evaluation of a chatbot intervention," *BMC Public Health*, vol. 21, no. 1, Dec. 2021, doi: 10.1186/s12889-021-12129-1.
- [10] A. Mariamo, C. E. Temcheff, P. M. Léger, S. Senecal, and M. A. Lau, "Emotional reactions and likelihood of response to questions designed for a mental health chatbot among adolescents: Experimental study," *JMIR Hum Factors*, vol. 8, no. 1, Jan. 2021, doi: 10.2196/24343.
- [11] A. Schick, J. Feine, S. Morana, A. Maedche, and U. Reininghaus, "Validity of Chatbot Use for Mental Health Assessment: Experimental Study," *JMIR Mhealth Uhealth*, vol. 10, no. 10, Oct. 2022, doi: 10.2196/28082.
- [12] T. Koulouri, R. D. MacRedie, and D. Olakitan, "Chatbots to Support Young Adults' Mental Health: An Exploratory Study of Acceptability," *ACM Trans Interact Intell Syst*, vol. 12, no. 2, Jun. 2022, doi: 10.1145/3485874.
- [13] Fayza Nayla Riyana Putri and Joko Riyono, "TEKNOLOGI ARTIFICIAL INTELLEGENCE DALAM UPAYA PENCEGAHAN BUNUH DIRI," *METRIK SERIAL HUMANIORA DAN SAINS*, vol. 3, 2022.
- [14] R. Crasto, L. Dias, D. Miranda and D. Kayande, "CareBot: A Mental Health ChatBot," 2021 2nd International Conference for Emerging Technology (INCET), Belagavi, India, 2021, pp. 1–5, doi: 10.1109/INCET51464.2021.9456326.
- [15] Y. He *et al.*, "Mental Health Chatbot for Young Adults With Depressive Symptoms During the COVID-19 Pandemic: Single-Blind, Three-Arm Randomized Controlled Trial," *J Med Internet Res*, vol. 24, no. 11, Nov. 2022, doi: 10.2196/40719.
- [16] G. Nicol, R. Wang, S. Graham, S. Dodd, and J. Garbutt, "Chatbot-Delivered Cognitive Behavioral Therapy in Adolescents With Depression and Anxiety During the COVID-19 Pandemic: Feasibility and Acceptability Study," *JMIR Form Res*, vol. 6, no. 11, Nov. 2022, doi: 10.2196/40242.
- [17] L. Wilson and M. Marasoiu, "The Development and Use of Chatbots in Public Health: Scoping Review," Oct. 01, 2022, *JMIR Publications Inc*. doi: 10.2196/35882.
- [18] S. H. Li, M. R. Achilles, S. Spanos, S. Habak, A. Werner-Seidler, and B. O'dea, "A cognitive behavioural therapy smartphone app for adolescent depression and anxiety: co-design of ClearlyMe," *Cogn Behav Therap*, vol. 15, no. 8, Mar. 2022, doi: 10.1017/S1754470X22000095.
- [19] A. Viduani *et al.*, "Assessing Mood With the Identifying Depression Early in Adolescence Chatbot (IDEABot): Development and Implementation Study," *JMIR Hum Factors*, vol. 10, 2023, doi: 10.2196/44388.
- [20] B. Omarov, Z. Zhumanov, A. Gumar, and L. Kuntunova, "Artificial Intelligence Enabled Mobile Chatbot Psychologist using AIML and Cognitive Behavioral Therapy," *International*

- Journal of Advanced Computer Science and Applications*, vol. 14, no. 6, pp. 137–146, 2023, doi: 10.14569/IJACSA.2023.0140616.
- [21] Y. He *et al.*, “Conversational Agent Interventions for Mental Health Problems: Systematic Review and Meta-analysis of Randomized Controlled Trials,” 2023, *JMIR Publications Inc.* doi: 10.2196/43862.
- [22] M. N. R. N. Suryono, R. E. Bhagaskara, M. A. Pratama, and A. Pratama, “Analisis Pengaruh ChatGPT Terhadap Produktivitas Mahasiswa,” *Prosiding Seminar Nasional Teknologi dan Sistem Informasi*, 2023.
- [23] R. Martin and S. Richmond, “Conversational agents for Children’s mental health and mental disorders: A scoping review,” *Computers in Human Behavior: Artificial Humans*, vol. 1, no. 2, p. 100028, Aug. 2023, doi: 10.1016/j.chbah.2023.100028.
- [24] A. Ahmed *et al.*, “Chatbot features for anxiety and depression: A scoping review,” *Health Informatics J*, vol. 29, no. 1, Jan. 2023, doi: 10.1177/14604582221146719.
- [25] E. F. Gbollie *et al.*, “Intention to use digital mental health solutions: A cross-sectional survey of university students attitudes and perceptions toward online therapy, mental health apps, and chatbots,” *Digit Health*, vol. 9, Jan. 2023, doi: 10.1177/20552076231216559.
- [26] K. Joshi, “AI Mental Health Therapist Chatbot,” *Int J Res Appl Sci Eng Technol*, vol. 11, no. 11, pp. 308–311, Nov. 2023, doi: 10.22214/ijraset.2023.56393.
- [27] J. Moilanen, N. van Berkel, A. Visuri, U. Gadiraju, W. van der Maden, and S. Hosio, “Supporting mental health self-care discovery through a chatbot,” *Front Digit Health*, vol. 5, 2023, doi: 10.3389/fdgh.2023.1034724.
- [28] A. R. Wrightson-Hester *et al.*, “An Artificial Therapist (Manage Your Life Online) to Support the Mental Health of Youth: Co-Design and Case Series,” *JMIR Hum Factors*, vol. 10, 2023, doi: 10.2196/46849.
- [29] D. Rahadiyan *et al.*, “Chatbot for Mental Health Using Tf-Idf and SVM,” *IT FOR SOCIETY*, vol. 09, no. 02, 2023.
- [30] C. Schillings, D. Meissner, B. Erb, D. Schultchen, E. Bendig, and O. Pollatos, “A chatbot-based intervention with ELME to improve stress and health-related parameters in a stressed sample: Study protocol of a randomised controlled trial,” *Front Digit Health*, vol. 5, 2023, doi: 10.3389/fdgh.2023.1046202.
- [31] B. Kelana, R. A. Syaani, F. Kristanto, and P. A. Winata, “Kepercayaan Generasi Z pada Chatbot Layanan Kesehatan Mental Generation Z’s Trust in The Chatbot of Mental Health Service,” 2023.
- [32] I. M. M. Matin, M. Agustin, B. Sugiarto, and A. N. Asri, “DETEKSI MALWARE MENGGUNAKAN MACHINE LEARNING DENGAN METODE ENSEMBLE,” *Prosiding Sains Nasional dan Teknologi*, vol. 13, no. 1, pp. 265–270, Nov. 2023, doi: 10.36499/psnst.v13i1.9224.
- [33] H. Li, R. Zhang, Y. C. Lee, R. E. Kraut, and D. C. Mohr, “Systematic review and meta-analysis of AI-based conversational agents for promoting mental health and well-being,” Dec. 01, 2023, *Nature Research*. doi: 10.1038/s41746-023-00979-5.
- [34] N. Reddy Aturi, “Cognitive Behavioral Therapy (CBT) Delivered via AI and Robotics,” *International Journal of Science and Research (IJSR)*, vol. 12, no. 2, pp. 1773–1777, Feb. 2023, doi: 10.21275/sr230313144412.
- [35] A. Aggarwal, C. C. Tam, D. Wu, X. Li, and S. Qiao, “Artificial Intelligence–Based Chatbots for Promoting Health Behavioral Changes: Systematic Review,” 2023, *JMIR Publications Inc.* doi: 10.2196/40789.
- [36] C. Potts *et al.*, “A Multilingual Digital Mental Health and Well-Being Chatbot (ChatPal): Pre-Post Multicenter Intervention Study,” *J Med Internet Res*, vol. 25, 2023, doi: 10.2196/43051.
- [37] S. Ulrich, N. Lienhard, H. Künzli, and T. Kowatsch, “A Chatbot-Delivered Stress Management Coaching for Students (MISHA App): Pilot Randomized Controlled Trial,” *JMIR Mhealth Uhealth*, vol. 12, p. e54945, Jun. 2024, doi: 10.2196/54945.
- [38] A. Akhtar *et al.*, “Scalable Technology for Adolescents and Youth to Reduce Stress in the Treatment of Common Mental Disorders in Jordan: Protocol for a Randomized Controlled Trial,” *JMIR Res Protoc*, vol. 13, 2024, doi: 10.2196/54585.
- [39] M. Casu, S. Triscari, S. Battiato, L. Guarnera, and P. Caponnetto, “AI Chatbots for Mental Health: A Scoping Review of Effectiveness, Feasibility, and Applications,” Jul. 01, 2024, *Multidisciplinary Digital Publishing Institute (MDPI)*. doi: 10.3390/app14135889.
- [40] B. Kelana, A. R. Qodri, and Muruliza S., “Desain Chatbot Layanan Daring Kesehatan Mental yang Sesuai Persepsi dan Kepuasan Generasi Z,” *Jurnal Sistem Komputer dan Kecerdasan Buatan*, 2024.
- [41] M. Azalia Banowati *et al.*, “PENGEMBANGAN ‘AUTOBOT SARAS004’ AGEN SOSIALISASI UU KIA NOMOR 04 TAHUN 2024 SEBAGAI

- ANTISIPATIF POST-PARTUM DEPRESSION,” *Jurnal PenaEmas*, vol. 3, no. 1, 2025.
- [42] L. Andrade-Arenas, C. Yactayo-Arias, and F. Pucuhuayla-Revatta, “Therapy and Emotional Support through a Chatbot,” *International journal of online and biomedical engineering*, vol. 20, no. 2, pp. 114–130, 2024, doi: 10.3991/ijoe.v20i02.45377.
- [43] H. Qing Yu and S. McGuinness, “An Experimental Study of Integrating Fine-tuned LLMs and Prompts for Enhancing Mental Health Support Chatbot System,” 2024.
- [44] M. V Heinz *et al.*, “Evaluating Therabot: A Randomized Control Trial Investigating the Feasibility and Effectiveness of a Generative AI Therapy Chatbot for Depression, Anxiety, and Eating Disorder Symptom Treatment,” 2024.
- [45] C. A. Khairan and M. S. Habib, “CHATBOT AI DALAM IDENTIFIKASI AWAL GANGGUAN KESEHATAN MENTAL DI INDONESIA: TANTANGAN DAN PROSPEK,” 2024.
- [46] Fitriana, Sulfikar.K, and Maslina, “KECERDASAN BUATAN DAN KOMUNIKASI EFEKTIF MENAVIGASI TANTANGAN DAN PELUANG DALAM BIMBINGAN KONSELING KONTEMPORER,” *Jurnal Media Intelektual Muslim dan Bimbingan Rohani*, vol. 10, 2024.
- [47] A. L. MacNeill, S. Doucet, and A. Luke, “Effectiveness of a Mental Health Chatbot for People With Chronic Diseases: Randomized Controlled Trial,” *JMIR Form Res*, vol. 8, 2024, doi: 10.2196/50025.
- [48] B. Carlinda, D. Bachri, A. J. Muthmainnah, C. Juliani, M. Qonitatunnajah, and W. P. Wicaksono, “SCOPING REVIEW: TEKNOLOGI BERBASIS ARTIFICIAL INTELLIGENCE DALAM MENCEGAH SUICIDE IDEATION GENERASI Z INDONESIA,” 2024.
- [49] F. Debby Christine Fernande and D. Mardvin Siokain, “Systematic Literature Review: Intervensi Digital untuk Meningkatkan Kesehatan Mental pada Remaja,” *Delvy Mardvin Siokain INNOVATIVE: Journal Of Social Science Research*, vol. 5, pp. 6829–6842, 2024.
- [50] Sabour, S., Zhang, W., Xiao, X., Zhang, Y., Zheng, Y., Wen, J., ... & Huang, M. (2023). A chatbot for mental health support: exploring the impact of Emohaa on reducing mental distress in China. *Frontiers in digital health*, 5, 1133987..
- [51] C. Wijaya Fakultas Psikologi, U. Diponegoro, J. Sunario, and K. Tembalang, “PEMANFAATAN KECERDASAN BUATAN DALAM APLIKASI MODERATED ONLINE SOCIAL THERAPY UNTUK PEMULIHAN KESEHATAN MENTAL REMAJA,” 2024.
- [52] J. Dray and D. Symons, “Review of Innovative Mental Health Support for Children and Young People: Generative AI Co-design Applications and Challenges,” Dec. 01, 2024, *Springer Science and Business Media Deutschland GmbH*. doi: 10.1007/s40474-025-00328-z.
- [53] R. Balan, A. Dobrean, and C. R. Poetar, “Use of automated conversational agents in improving young population mental health: a scoping review,” Dec. 01, 2024, *Nature Research*. doi: 10.1038/s41746-024-01072-1.
- [54] R. I. Permatasari, D. P. Artha, B. S. Wiratama, and H. Wulandari, “Overview of chatbot usage on mental health: a scoping review,” in *BIO Web of Conferences*, EDP Sciences, Oct. 2024. doi: 10.1051/bioconf/202413205002.
- [55] M. J. Beg, M. Verma, V. C. K. M. M, and M. K. Verma, “Artificial Intelligence for Psychotherapy: A Review of the Current State and Future Directions,” Jul. 01, 2024, *SAGE Publications Ltd*. doi: 10.1177/02537176241260819.
- [56] L. Chen, D. A. Preece, P. Sikka, J. J. Gross, and B. Krause, “A Framework for Evaluating Appropriateness, Trustworthiness, and Safety in Mental Wellness AI Chatbots,” *Human Computer Interaction*, Jul. 2024, [Online]. Available: <http://arxiv.org/abs/2407.11387>
- [57] S. Karkosz, R. Szymański, K. Sanna, and J. Michałowski, “Effectiveness of a Web-based and Mobile Therapy Chatbot on Anxiety and Depressive Symptoms in Subclinical Young Adults: Randomized Controlled Trial,” *JMIR Form Res*, vol. 8, 2024, doi: 10.2196/47960.
- [58] A. Khumairo, A. Halik, L. K. Ningrum, and C. Zahra, “Efektivitas Chatbot Konseling Terhadap Kesehatan Mental Mahasiswa BPI IAIN Metro,” *Islamic Guidance and Counseling Journal*, 2024, doi: 10.51192/cons.v5i1.1257.
- [59] J. Li *et al.*, “Chatbot-delivered structured psychological intervention (SPI-Bot) for teenagers with adolescent idiopathic scoliosis in Hong Kong: protocol for a pilot randomised controlled trial,” *BMJ Open*, vol. 15, no. 7, Jul. 2025, doi: 10.1136/bmjopen-2025-098734.
- [60] W. Pichowicz, M. Kotas, and P. Piotrowski, “Performance of mental health chatbot agents in detecting and managing suicidal ideation,” *Sci Rep*, vol. 15, no. 1, Dec. 2025, doi: 10.1038/s41598-025-17242-4.
- [61] J. Hasei *et al.*, “Empowering pediatric, adolescent, and young adult patients with

- cancer utilizing generative AI chatbots to reduce psychological burden and enhance treatment engagement: a pilot study,” *Front Digit Health*, vol. 7, 2025, doi: 10.3389/fdgth.2025.1543543.
- [62] D. H. Vasquez, N. Rupani, C. Contreras, L. Kolevic, M. F. Franke, and J. T. Galea, “Building ‘EVA’: Human-Centered Development of a Mental Health Chatbot for Adolescents Living with HIV: Tutorial (Preprint),” Apr. 02, 2025. doi: 10.2196/preprints.75351.
- [63] K. Citation Yublina, R. Riantofani, R. Siti, and K. Kiftiyah, “Designing AI-Driven Chatbots for Adolescent Mental Health Support in Rural Schools (Sekolah Tinggi Teologi Injili Arastamar Jakarta),” *International Journal of Research in Counseling*, vol. 4, no. 1, p. 83, 2025, doi: 10.70363/ijrc.v3i2.307.
- [64] F. Nuraini, M. Najamuddin, D. Miharja, and A. H. Anshor, “Mental Health Chatbot for Detecting Depression Symptoms Using Natural Language Processing and DASS-21,” *Jurnal Teknologi Universitas Muhammadiyah Jakarta*, 2025, doi: 10.24853/jurtek.17.2.133-142.
- [65] S. Deebe, P. P. K. A. A. Lakshmi, A. Professor, and U. Student, “AI ENABLED PSYCHOLOGIST CHATBOT,” *IJEDR2502002 International Journal of Engineering Development and Research*, 2025, [Online]. Available: www.ijedr.org
- [66] D. Agustina, “APLIKASI KESEHATAN MENTAL: SOLUSI DIGITAL UNTUK MENGELOLA STRES,” 2025.
- [67] E. Mayor, “Chatbots and mental health: a scoping review of reviews,” *Current Psychology*, Aug. 2025, doi: 10.1007/s12144-025-08094-2.
- [68] S. Jaybhaye, S. Deogade, S. Sanap, T. Mali and U. Shendge, "BlissBot: Mental Health Chatbot," 2024 IEEE Region 10 Symposium (TENSYP), New Delhi, India, 2024, pp. 1-5, doi: 10.1109/TENSYP61132.2024.10752315.
- [69] Q. Halimatul Hidayah and R. Putra Laksana, “EDUKASI TENTANG DAMPAK PENGGUNAAN TEKNOLOGI TERHADAP KESEHATAN MENTAL REMAJA,” 2025.
- [70] G. Yoseppin1, A. Mas, N. Dewi2, and Y. K. Purba, “Fenomena Chatbot AI Sebagai Teman Curhat: Implikasi Pada Hubungan Antarpribadi di Era Digital,” 2025. [Online]. Available: www.bps.go.id/id/
- [71] Annisa Nabiilah Saputri, “KEMAJUAN TEKNOLOGI DALAM MENDUKUNG KESEHATAN MENTAL PADA REMAJA MELALUI PENGGUNAAN KECERDASAN BUATAN,” 2025.
- [72] M. R. Ihsanuddin and R. Kurniawan, “Kajian Literatur Teknologi Digital untuk Intervensi Kesehatan Mental,” *Jurnal Sains, Nalar, dan Aplikasi Teknologi Informasi*, vol. 4, no. 2, pp. 111–128, Jul. 2025, doi: 10.20885/snati.v4.i2.40578.
- [73] G. Lesmana, A. Amran, and P. Studi Bimbingan dan Konseling, “Latihan Reframing Diri dengan Bantuan AI: Tranformasi Pikiran Negatif menjadi Pikiran Positif,” *Jurnal Pengabdian Masyarakat Larisma (JPML)*, vol. 2, no. 1, pp. 8–12, 2025.
- [74] B. Jurnal, E. Karyati, E. Agustina Julisawati, and J. Selatan, “Kesehatan Mental Mahasiswa di Era Digital: Tinjauan Literatur Psikologi Klinis dan Sosial,” *Jurnal Ilmu Sosial dan Humaniora*, vol. 1, pp. 442–451, 2025, doi: 10.63822/pmx2a928.
- [75] M. Zidan, J. Rawamangun Muka Raya, J. Timur, D. Jakarta, A. Info, and A. History, “PEMANFAATAN KECERDASAN BUATAN UNTUK DETEKSI DINI GANGGUAN KESEHATAN MENTAL PADA REMAJA DI MEDIA SOSIAL,” 2025.
- [76] F. Fahrezi *et al.*, “Pemanfaatan Fitur @AnonymousChat Telegram sebagai Media Kuratif dalam Konseling Kecemasan bagi Remaja dan Dewasa Muda,” 2025. [Online]. Available: <https://e-journal.upr.ac.id/index.php/pdhp>
- [77] D. Keyan *et al.*, “The development of a World Health Organization transdiagnostic chatbot intervention for distressed adolescents and young adults,” *Front Digit Health*, vol. 7, 2025, doi: 10.3389/fdgth.2025.1528580.
- [78] F. O. Kuhlmeier, L. Hanschmann, M. Rabe, S. Luettker, E.-L. Brakemeier, and A. Maedche, “Combining Artificial Users and Psychotherapist Assessment to Evaluate Large Language Model-based Mental Health Chatbots,” Apr. 2025, [Online]. Available: <http://arxiv.org/abs/2503.21540>
- [79] T. Saputra and T. Saputra Universitas Bina Darma Tata Sutabri, “PENERAPAN CHATBOT SEBAGAI ALAT DIAGNOSIS INDIKASI PENYAKIT SETRES DENGAN MENGGUNAKAN METODE BACKWARD CHAINING,” *Jurnal Sains Student Research*, vol. 3, no. 2, pp. 441–447, 2025, doi: 10.61722/jssr.v3i2.4330.
- [80] F. Dany Prasetya, A. Rahmawati, and D. Vellyana, “Peran Teknologi Informasi Kesehatan Wysa Terhadap Manajemen Ansietas Mengerjakan Skripsi Mahasiswa,” 2025. [Online]. Available: <https://solonursingjournal.org/41>

- [81] A. Manole, R. Cârciuamaru, R. Brînzaș, and F. Manole, "An Exploratory Investigation of Chatbot Applications in Anxiety Management: A Focus on Personalized Interventions," Jan. 01, 2025, *Multidisciplinary Digital Publishing Institute (MDPI)*. doi: 10.3390/info16010011.
- [82] M. A. Kuhail, N. Alturki, J. Thomas, A. K. Alkhalifa, and A. Alshardan, "Human-Human vs Human-AI Therapy: An Empirical Study," *Int J Hum Comput Interact*, vol. 41, no. 11, pp. 6841–6852, 2025, doi: 10.1080/10447318.2024.2385001.
- [83] M. K. Anser, A. A. Nabi, I. Ahmad, M. M. Q. Abro, and K. Zaman, "Advancing Mental Health Care: A Comprehensive Review of Digital Tools and Technologies for Enhancing Diagnosis, Treatment, and Wellness," Jun. 01, 2025, *John Wiley and Sons Inc.* doi: 10.1002/hcs2.70018.
- [84] A. Najwa, "Pengaruh Psikologis Mahasiswa Terhadap Penggunaan AI: Scoping Review," 2025. [Online]. Available: <http://urj.uin-malang.ac.id/index.php/mij/index>
- [85] K. Kamdan, N. G. Fauziyah, M. A. Fadlullah, D. A. Hanif, and I. L. Kharisma, "Early Mental Health Detection and Emotional States in Teenagers Through Chatbot Systems Using Natural Language Processing (NLP)," in *The 7th International Global Conference Series on ICT Integration in Technical Education & Smart Society*, Basel Switzerland: MDPI, Sep. 2025, p. 64. doi: 10.3390/engproc2025107064.
- [86] L. A. Saidi, R. C. Tian Ming, and N. H. Rahaman, "Digital Mental Health Interventions (DHMIS) for Youth: A Systematic Review of Online Counselling Effectiveness," *International Journal of Academic Research in Business and Social Sciences*, vol. 15, no. 9, Sep. 2025, doi: 10.6007/IJARBS/v15-i9/26422.
- [87] M. Kim *et al.*, "Therapeutic Potential of Social Chatbots in Alleviating Loneliness and Social Anxiety: Quasi-Experimental Mixed Methods Study," *J Med Internet Res*, vol. 27, 2025, doi: 10.2196/65589.
- [88] R. Bryant and K. Carswell, "Effectiveness of a guided mental health chatbot for youth living in Jordan in communities exposed to adversity," 2025, *London, UK*. doi: 10.1186/ISRCTN19217696.
- [89] J. K. Park, V. K. Singh, and P. Wisniewski, "Current Landscape and Future Directions for Mental Health Conversational Agents for Youth: Scoping Review," 2025, *JMIR Publications Inc.* doi: 10.2196/62758.
- [90] T. Scholich, M. Barr, S. W. Stirman, and S. Raj, "A Comparison of Responses from Human Therapists and Large Language Model-Based Chatbots to Assess Therapeutic Communication: Mixed Methods Study," *JMIR Ment Health*, vol. 12, 2025, doi: 10.2196/69709.
- [91] Y. Feng *et al.*, "Effectiveness of AI-Driven Conversational Agents in Improving Mental Health Among Young People: Systematic Review and Meta-Analysis," *J Med Internet Res*, vol. 27, no. 1, 2025, doi: 10.2196/69639.
- [92] J. Fujita *et al.*, "Challenges in Implementing a Mobile AI Chatbot Intervention for Depression Among Youth on Psychiatric Waiting Lists: Randomized Controlled Study Termination Report," *J Med Internet Res*, 2025, doi: 10.1101/2024.11.25.24317880v1.
- [93] S. Zhu, Y. Wang, and Y. Hu, "Facilitators and Barriers to Digital Mental Health Interventions for Depression, Anxiety, and Stress in Adolescents and Young Adults: Scoping Review," *J Med Internet Res*, vol. 27, 2025, doi: 10.2196/62870.
- [94] M. Dechant, E. Lash, S. Shokr, and C. O'Driscoll, "Future Me, a Prospection-Based Chatbot to Promote Mental Well-Being in Youth: Two Exploratory User Experience Studies," *JMIR Form Res*, vol. 9, 2025, doi: 10.2196/74411.
- [95] S. H. Hong *et al.*, "Digital Mental Health Interventions for Adolescents: An Integrative Review Based on the Behavior Change Approach," Jun. 01, 2025, *Multidisciplinary Digital Publishing Institute (MDPI)*. doi: 10.3390/children12060770.
- [96] G. Sharp, B. Dwyer, A. Randhawa, I. McGrath, and H. Hu, "The Effectiveness of a Chatbot Single-Session Intervention for People on Waitlists for Eating Disorder Treatment: Randomized Controlled Trial," *J Med Internet Res*, vol. 27, 2025, doi: 10.2196/70874.
- [97] J. Li *et al.*, "Chatbot-Delivered Interventions for Improving Mental Health Among Young People: A Systematic Review and Meta-Analysis," Aug. 01, 2025, *John Wiley and Sons Inc.* doi: 10.1111/wvn.70059.
- [98] C. E. Palmer *et al.*, "Combining Artificial Intelligence and Human Support in Mental Health: Digital Intervention With Comparable Effectiveness to Human-Delivered Care," *J Med Internet Res*, vol. 27, 2025, doi: 10.2196/69351.
- [99] T. H. Chen, G. Chu, R. H. Pan, and W. F. Ma, "Effectiveness of mental health chatbots in depression and anxiety for adolescents and young adults: a meta-analysis of randomized controlled trials," 2025, *Taylor and Francis Ltd.* doi: 10.1080/17434440.2025.2466742.

- [100] A. Algumaei, N. M. Yaacob, M. Doheir, M. N. Al-Andoli, and M. Algumaie, "Symmetric Therapeutic Frameworks and Ethical Dimensions in AI-Based Mental Health Chatbots (2020–2025): A Systematic Review of Design Patterns, Cultural Balance, and Structural Symmetry," Jul. 01, 2025, *Multidisciplinary Digital Publishing Institute (MDPI)*. doi: 10.3390/sym17071082.
- [101] Sabila, R., Pratama, A., & Safitri, E. M. (2024). Evaluation virtual assistant chatbot acceptance with an unified technology acceptance and use of technology-based model. *Journal of Information Systems and Informatics*, 6(2), 919-936.
- [102] Suryono, M. N. R. N., Bhagaskara, R. E., Pratama, M. A., & Pratama, A. (2023, November). Analisis Pengaruh ChatGPT Terhadap Produktivitas Mahasiswa. In *Prosiding Seminar Nasional Teknologi Dan Sistem Informasi* (Vol. 3, No. 1, pp. 364-373).
- [103] Suryanto, T. L. M., Wibawa, A. P., Hariyono, H., & Nafalski, A. (2023). Evolving conversations: A review of chatbots and implications in natural language processing for cultural heritage ecosystems. *International Journal of Robotics and Control Systems*, 3(4), 955-1006.
- [104] Pratiwi, E. E., Aisy, A. R., Rahmaddeni, R., & Ananta, N. (2025). KLASIFIKASI KESEHATAN MENTAL PADA USIA REMAJA MENGGUNAKAN METODE SVM. *Jurnal Informatika dan Teknik Elektro Terapan*, 13(2).