

An Analysis of AI's Function in Mental Well-Being

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Abstract: Artificial intelligence (AI) and mental health are fields that are developing at a very fast pace and have the potential to have a big impact on each other. The study of prospective AI treatments has been spurred by the rising incidence of mental health issues. These treatments seem promising for early identification, prevention, and therapy. Complex machine learning algorithms are able to analyze large amounts of data, such as speech patterns and postings on social media, in order to identify patterns and symptoms related to mental health disorders. This makes it easier to put more targeted treatments and customized treatment plans into practice. Moreover, AI-powered chatbots may provide 24-hour support to those experiencing immediate distress or provide therapeutic access in situations where waiting lists are lengthy. However, it is crucial to make sure that ethical considerations are taken into account at every stage of the use of AI in the area of mental healthcare. It is critical to address a number of issues, including as privacy, prejudice, and proper diagnosis, in order to accomplish effective integration. But the intersection of AI and mental health presents a unique opportunity to change how we think about mental illness and provide access to treatment for a great number of people worldwide

Keywords: Artificial Intelligence; Mental Health; Assessment; Accessibility; Outcomes.

REFERENCES

- [1]. Torous J, Bucci S, Bell IH, Kessing LV, Faurholt-Jepsen M, Whelan P, Carvalho AF, Keshavan M, Linardon J, Firth J. The growing field of digital psychiatry: current evidence and the future of apps, social media, chatbots, and virtual reality. *World Psychiatry* 2021; 20(3):318-335. DOI: <https://doi.org/10.1002/wps.20883>
- [2]. Lee EE, Torous J, De Choudhury M, Depp CA, Graham SA, Kim HC, Paulus MP, Krystal JH, Jeste DV. Artificial intelligence for mental health care: clinical applications, barriers, facilitators, and artificial wisdom. *Biol Psychiatry Cogn Neurosci Neuroimaging* 2021; 6(9):856-864. DOI: <https://doi.org/10.1016/j.bpsc.2021.02.001>
- [3]. Le Glaz A, Haralambous Y, Kim-Dufor DH, Lenca P, Billot R, Ryan TC, Marsh J, DeVylder J, Walter M, Berrouiguet S, Lemey C. Machine learning and natural language processing in mental health: Systematic review. *J Med Internet Res* 2021; 23(5):e15708. DOI: <https://doi.org/10.2196/15708>
- [4]. Maples-Keller JL, Bunnell BE, Kim SJ, Rothbaum BO. The use of virtual reality technology in the treatment of anxiety and other psychiatric disorders. *Harv Rev Psychiatry* 2017; 25(3):103-113. DOI: <https://doi.org/10.1097/HRP.000000000000138>
- [5]. Parsapoor Mah Parsa M, Koudys JW, Ruocco AC. Suicide risk detection using artificial intelligence: The promise of creating a benchmark dataset for research on the detection of suicide risk. *Front Psychiatry* 2023; 14:1186569. DOI: <https://doi.org/10.3389/fpsy.2023.1186569>
- [6]. Gerke S, Minssen T, Cohen G. Ethical and legal challenges of artificial intelligence-driven healthcare. *Artif Intell Healthc* 2020:295-336. DOI: <https://doi.org/10.1016/B978-0-12-818438-7.00012-5>
- [7]. Johnson KB, Wei WQ, Weeraratne D, Frisse ME, Misulis K, Rhee K, Zhao J, Snowdon JL. Precision medicine, AI, and the future of personalized health care. *Clin Transl Sci* 2021; 14(1):86-93. DOI: <https://doi.org/10.1111/cts.12884>
- [8]. Gauthier A, Rizvi S, Cukurova M, Mavrikis M. Is it time we get real? A systematic review of the potential of data-driven technologies to address teachers' implicit biases. *Front Artif Intell* 2022; 5:994967. DOI: <https://doi.org/10.3389/frai.2022.994967>

- [9]. Ahuja AS. The impact of artificial intelligence in medicine on the future role of the physician. *PeerJ* 2019; 7:e7702. DOI: <https://doi.org/10.7717/peerj.7702>
- [10]. Gianfrancesco MA, Tamang S, Yazdany J, Schmajuk G. Potential biases in machine learning algorithms using electronic health record data. *JAMA Intern Med* 2018; 178(11):1544-1547. DOI: <https://doi.org/10.1001/jamainternmed.2018.3763>
- [11]. Petersson L, Vincent K, Svedberg P, Nygren JM, Larsson I. Ethical considerations in implementing AI for mortality prediction in the emergency department: Linking theory and practice. *Digit Health* 2023; 9:20552076231206588. DOI: <https://doi.org/10.1177/20552076231206588>
- [12]. Haque MDR, Rubya S. An overview of chatbot-based mobile mental health apps: Insights from app description and user reviews. *JMIR Mhealth Uhealth* 2023; 11:e44838. DOI: <https://doi.org/10.2196/44838>
- [13]. Bajwa J, Munir U, Nori A, Williams B. Artificial intelligence in healthcare: Transforming the practice of medicine. *Future Healthc J* 2021; 8(2):e188-e194. DOI: <https://doi.org/10.7861/fhj.2021-0095>
- [14]. Batko K, Ślęzak A. The use of big data analytics in healthcare. *J Big Data* 2022; 9(1):3. DOI: <https://doi.org/10.1186/s40537-021-00553-4>
- [15]. Pham KT, Nabizadeh A, Sele K. Artificial intelligence and chatbots in psychiatry. *Psychiatr Q*. 2022 Mar;93(1):249-253. DOI: <https://doi.org/10.1007/s1126-022-09973-8>
- [16]. Reed JE, Card AJ. The problem with Plan-Do-Study-Act cycles. *BMJ Qual Saf* 2016; 25(3):147-152. DOI: <https://doi.org/10.1136/bmjqs-2015-005076>
- [17]. Yazdavar AH, Mahdavejad MS, Bajaj G, Romine W, Sheth A, Monadjemi AH, Thirunarayan K, Meddar JM, Myers A, Pathak J, Hitzler P. Multimodal mental health analysis in social media. *PLoS One* 2020; 15(4):e0226248. DOI: <https://doi.org/10.1371/journal.pone.0226248>
- [18]. Sutton RT, Pincock D, Baumgart DC, Sadowski DC, Fedorak RN, Kroeker KI. An overview of clinical decision support systems: Benefits, risks, and strategies for success. *NPJ Digit Med* 2020; 3:17. DOI: <https://doi.org/10.1038/s41746-020-0221-y>
- [19]. Varkey B. Principles of clinical ethics and their application to practice. *Med Princ Pract* 2021; 30(1):17-28. DOI: <https://doi.org/10.1159/000509119>
- [20]. Rubeis G. iHealth: The ethics of artificial intelligence and big data in mental healthcare. *Internet Interv* 2022; 28:100518. DOI: <https://doi.org/10.1016/j.invent.2022.100518>
- [21]. King CA, Horwitz A, Czyz E, Lindsay R. Suicide risk screening in healthcare settings: Identifying males and females at risk. *J Clin Psychol Med Settings* 2017; 24(1):8-20. DOI: <https://doi.org/10.1007/s10880-017-9486-y>
- [22]. Coulter A, Oldham J. Person-centred care: What is it and how do we get there? *Future Hosp J* 2016; 3(2):114-116. DOI: <https://doi.org/10.7861/futurehosp.3-2-114>
- [23]. Quazi S. Artificial intelligence and machine learning in precision and genomic medicine. *Med Oncol* 2022; 39(8):120. DOI: <https://doi.org/10.1007/s12032-022-01711-1>
- [24]. Chen J, Mullins CD, Novak P, Thomas SB. Personalized strategies to activate and empower patients in health care and reduce health disparities. *Health Educ Behav* 2016; 43(1):25-34. DOI: <https://doi.org/10.1177/1090198115579415>
- [25]. Baker R, Camosso-Stefinovic J, Gillies C, Shaw EJ, Cheater F, Flottorp S, Robertson N, Wensing M, Fiander M, Eccles MP, Godycki-Cwirko M, van Lieshout J, Jäger C. Tailored interventions to address determinants of practice. *Cochrane Database Syst Rev* 2015; 2015(4):CD005470. DOI: <https://doi.org/10.1002/14651858.CD005470.pub3>
- [26]. Davenport T, Kalakota R. The potential for artificial intelligence in healthcare. *Future Healthc J* 2019; 6(2):94-98. DOI: <https://doi.org/10.7861/futurehosp.6-2-94>
- [27]. Richardson JP, Smith C, Curtis S, Watson S, Zhu X, Barry B, Sharp RR. Patient apprehensions about the use of artificial intelligence in healthcare. *NPJ Digit Med* 2021; 4(1):140. DOI: <https://doi.org/10.1038/s41746-021-00509-1>
- [28]. Hall WJ, Chapman MV, Lee KM, Merino YM, Thomas TW, Payne BK, Eng E, Day SH, Coyne-Beasley T. Implicit racial/ethnic bias among health care professionals and its influence on health care outcomes: A

- systematic review. *Am J Public Health* 2015; 105(12):e60-e76. DOI: <https://doi.org/10.2105/AJPH.2015.302903>
- [29]. Bohr A, Memarzadeh K. The rise of artificial intelligence in healthcare applications. *Artif Intell Healthc* 2020;25-60. DOI: <https://doi.org/10.1016/B978-0-12-818438-7.00002-2>
- [30]. Sabry F, Eltaras T, Labda W, Alzoubi K, Malluhi Q. Machine learning for healthcare wearable devices: The big picture. *J Healthc Eng* 2022; 2022:4653923. DOI: <https://doi.org/10.1155/2022/4653923>
- [31]. Jadczyk T, Wojakowski W, Tendera M, Henry TD, Egnaczyk G, Shreenivas S. Artificial intelligence can improve patient management at the time of a pandemic: The role of voice technology. *J Med Internet Res* 2021; 23(5):e22959. DOI: <https://doi.org/10.2196/22959>
- [32]. Stafie CS, Sufaru IG, Ghiciuc CM, Stafie II, Sufaru EC, Solomon SM, Hancianu M. Exploring the intersection of artificial intelligence and clinical healthcare: A multidisciplinary review. *Diagnostics (Basel)* 2023; 13(12):1995. DOI: <https://doi.org/10.3390/diagnostics13121995>
- [33]. Institute of Medicine (US) Committee on Regional Health Data Networks; Donaldson MS, Lohr KN, editors. *Health Data in the Information Age: Use, Disclosure, and Privacy*. Washington (DC): National Academies Press (US); 1994. 4, Confidentiality and Privacy of Personal Data. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK236546/>
- [34]. Nazer LH, Zatarah R, Waldrip S, Ke JXC, Moukheiber M, Khanna AK, Hicklen RS, Moukheiber L, Moukheiber D, Ma H, Mathur P. Bias in artificial intelligence algorithms and recommendations for mitigation. *PLOS Digit Health* 2023; 2(6):e0000278. DOI: <https://doi.org/10.1371/journal.pdig.0000278>
- [35]. Gurevich E, El Hassan B, El Morr C. Equity within AI systems: What can health leaders expect? *Healthc Manage Forum* 2023; 36(2):119-124. DOI: <https://doi.org/10.1177/08404704221125368>
- [36]. Zhang T, Schoene AM, Ji S, Ananiadou S. Natural language processing applied to mental illness detection: A narrative review. *NPJ Digit Med* 2022; 5(1):46. DOI: <https://doi.org/10.1038/s41746-022-00589-7>
- [37]. Sheikhalishahi S, Miotto R, Dudley JT, Lavelli A, Rinaldi F, Osmani V. Natural language processing of clinical notes on chronic diseases: Systematic review. *JMIR Med Inform* 2019; 7(2):e12239. DOI: <https://doi.org/10.2196/12239>
- [38]. Vaidyam AN, Wisniewski H, Halamka JD, Kashavan MS, Torous JB. Chatbots and conversational agents in mental health: A review of the psychiatric landscape. *Can J Psychiatry* 2019; 64(7):456-464. DOI: <https://doi.org/10.1177/0706743719828977>
- [39]. Rabbani N, Bedgood M, Brown C, Steinberg E, Goldstein RL, Carlson JL, Pageler N, Morse KE. A natural language processing model to identify confidential content in adolescent clinical notes. *Appl Clin Inform* 2023; 14(3):400-407. DOI: <https://doi.org/10.1055/a-2051-9764>
- [40]. Straw I, Callison-Burch C. Artificial Intelligence in mental health and the biases of language based models. *PLoS One* 2020; 15(12):e0240376. DOI: <https://doi.org/10.1371/journal.pone.0240376>
- [41]. Coghlan S, Leins K, Sheldrick S, Cheong M, Gooding P, D'Alfonso S. To chat or bot to chat: Ethical issues with using chatbots in mental health. *Digit Health* 2023; 9:20552076231183542. DOI: <https://doi.org/10.1177/20552076231183542>
- [42]. Graham S, Depp C, Lee EE, Nebeker C, Tu X, Kim HC, Jeste DV. Artificial intelligence for mental health and mental illnesses: An overview. *Curr Psychiatry Rep* 2019; 21(11):116. DOI: <https://doi.org/10.1007/s11920-019-1094-0>
- [43]. Ashrafian H. Can artificial intelligences suffer from mental illness? A philosophical matter to consider. *Sci Eng Ethics* 2017; 23(2):403-412. DOI: <https://doi.org/10.1007/s11948-016-9783-0>
- [44]. Yan WJ, Ruan QN, Jiang K. Challenges for artificial intelligence in recognizing mental disorders. *Diagnostics (Basel)* 2022; 13(1):2. DOI: <https://doi.org/10.3390/diagnostics13010002>
- [45]. Robinson OJ, Vytal K, Cornwell BR, Grillon C. The impact of anxiety upon cognition: perspectives from human threat of shock studies. *Front Hum Neurosci* 2013; 7:203. DOI: <https://doi.org/10.3389/fnhum.2013.00203>

- [46]. Ijadi-Maghsoodi R, Marlotte L, Garcia E, Aralis H, Lester P, Escudero P, Kataoka S. Adapting and implementing a school-based resilience-building curriculum among low-income racial and ethnic minority students. *Contemp Sch Psychol* 2017; 21(3):223-239. DOI: <https://doi.org/10.1007/s40688-017-0134-1>
- [47]. Morrow E, Zidaru T, Ross F, Mason C, Patel KD, Ream M, Stockley R. Artificial intelligence technologies and compassion in healthcare: A systematic scoping review. *Front Psychol* 2023; 13:971044. DOI: <https://doi.org/10.3389/fpsyg.2022.971044>
- [48]. Esmailzadeh P, Mirzaei T, Dharanikota S. Patients' perceptions toward human-artificial intelligence interaction in health care: Experimental study. *J Med Internet Res* 2021; 23(11):e25856. DOI: <https://doi.org/10.2196/25856>.