# AI and real-time monitoring transform suicide risk detection



Suicide remains a profound and multifaceted challenge in public health, characterised by its complexity and devastating impact on individuals and communities alike. Detecting suicidal thoughts and behaviours poses a particular difficulty, as these can change rapidly and may not be present during clinical appointments. This predicament is further complicated by traditional methods, such as standardised checklists, which often fall short in capturing the nuances of an individual's mental state at critical moments.

In the digital age, many individuals regularly track various facets of their physical health using smartphones and wearable devices, from counting daily steps to monitoring sleep patterns. Expanding this concept into the realm of mental health, researchers are turning to a method known as ecological momentary assessment (EMA). This innovative approach collects real-time data about an individual’s mood, thoughts, behaviours, and environmental factors through automated prompts via technology. It can involve direct user input, known as active EMA, or passive data collection through device sensors.

Recent studies have established that EMA can be a safe and effective method for monitoring suicide risk. It fosters a more nuanced and immediate insight into an individual’s mental state, providing a moment-by-moment understanding that static assessments often overlook. Through EMA, individuals can receive timely interventions tailored to their specific needs—a concept captured in the development of adaptive interventions. This process allows devices to deliver personalised responses based on detected distress signals, prompting users to engage with their personalised safety plans created in collaboration with mental health professionals.

As research continues to explore the application of AI and machine learning in predicting suicide risk, the findings have been promising. Machine learning models have demonstrated the ability to identify subtle fluctuations in emotions and behaviours that may indicate increased risk, showcasing a significant advancement over traditional prediction tools. Moreover, emerging guidelines in mental health now advocate for a shift away from rudimentary risk scores, advocating instead for more person-centred approaches that prioritise open dialogue and collaborative planning.

Despite these advancements, essential questions remain regarding the ethical implications of AI in mental health monitoring. Researchers are raising concerns around privacy issues, particularly involving the handling of personal and social media data, which are often crucial for training AI models. Additionally, the lack of diversity in the datasets used to train these technologies raises critical questions about the applicability and fairness of AI predictions across different demographics.

Notably, some efforts are being made beyond mental health clinics; for instance, AI tools developed by companies like Samurai Labs and Sentinet analyse social media posts for distress signals, potentially triggering interventions. These platforms aim to bridge gaps in mental health support by alerting mental health professionals—though experts caution against over-reliance on technology, emphasising that human judgement remains indispensable in crisis situations.

There are also promising developments in specialised applications like 'Emma', a digital companion app designed for EMA that gathers real-time emotional and social data, offering interactive tools for suicide prevention. This app exemplifies the feasibility of integrating technology into mental health care, enabling more personalised support systems for individuals at risk.

As we continue to navigate the complexities of suicide prevention, the intertwining of AI, real-time monitoring, and user-focused interventions offers a glimmer of hope. While these tools are not definitive solutions, they do represent a significant evolution in our capacity to support those in distress—providing timely assistance in ways that were previously unimaginable.

As research evolves, the integration of EMA and AI may pave the way for a future where mental health diagnostics are more nuanced, ethical, and effective—ultimately contributing to improved outcomes for individuals grappling with the darkest of thoughts.

### Reference Map

1. Paragraphs 1, 2, 3, 4, 5, 6, 7
2. Paragraph 2, 3, 4
3. Paragraph 4
4. Paragraph 4
5. Paragraph 4
6. Paragraph 6
7. Paragraph 4, 6

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## Bibliography

1. <https://www.miragenews.com/ai-steps-up-real-time-monitoring-in-suicide-1459466/> - Please view link - unable to able to access data
2. <https://www.miragenews.com/ai-steps-up-real-time-monitoring-in-suicide-1459466/> - This article discusses the challenges in suicide prevention, emphasizing the difficulty in detecting suicidal thoughts and behaviors that can fluctuate rapidly. It introduces ecological momentary assessment (EMA), a method that collects real-time data on a person's mood, thoughts, and surroundings through smartphones or wearable devices. The piece highlights research indicating that EMA is safe for monitoring suicide risk and can provide a detailed, moment-by-moment understanding of an individual's mental state. It also explores the potential of adaptive interventions, where real-time, personalized responses are delivered via devices, and the role of artificial intelligence (AI) and machine learning in predicting suicide risk by analyzing subtle changes in a person's feelings, thoughts, or behavior. The article acknowledges concerns such as privacy issues and the lack of diversity in data used to train these models but notes that AI models can predict suicide risk more accurately than traditional tools, leading to recommendations for a more flexible, person-centered approach in mental health care.
3. <https://time.com/6696703/ai-suicide-prevention-social-media/> - This article explores how AI companies like Samurai Labs and Sentinet are developing tools to identify individuals at risk of suicide through their social media posts. By analyzing large volumes of data, these AI systems can detect distress signals in real-time, prompting interventions such as support messages and involvement of emergency responders. While AI offers potential in suicide prevention, experts caution that it should be used responsibly and cannot replace human judgment in mental health crises. Concerns include privacy issues, ethical implications, and potential inaccuracies leading to false positives. The article suggests that social media platforms should enhance protective measures promoting positive mental health and address issues before they escalate to acute crises.
4. <https://www.axios.com/2017/12/15/in-small-study-machine-learning-tech-can-identify-suicidal-tendencies-1513306565> - This article reports on a study published in Nature Human Behavior demonstrating the ability of artificial intelligence (AI) to identify suicidal tendencies in individuals. The research illustrates significant potential for AI to assist in psychiatric evaluations, expanding on its current applications in medical fields such as tumor detection and the prediction of depressive disorders. This development underscores the broader implications of AI technology in enhancing mental health diagnostics and potentially aiding in suicide prevention efforts.
5. <https://mhealth.jmir.org/2020/10/e15741/> - This study presents the development and evaluation of 'Emma,' a digital companion app designed for ecological momentary assessment (EMA) and suicide prevention. The app collects real-time data on users' psychological, emotional, and social fluctuations, providing a detailed picture of their symptoms and behaviors. It includes interactive and customized ecological momentary intervention (EMI) modules for suicide prevention, such as safety plans and emotion regulation tools. The study found that while EMA completion rates varied among participants, the app was generally well-accepted and feasible. It suggests that digital tools like Emma can complement existing emergency procedures and improve coordination among different health services, offering personalized support to individuals at high risk of suicide.
6. <https://pubmed.ncbi.nlm.nih.gov/34003405/> - This systematic review examines the use of ecological momentary assessment (EMA) in studying suicidal thoughts and behaviors. EMA involves asking patients questions in real time within their usual environment, providing detailed information about fluctuations in suicidal thoughts and behaviors over short periods. The review included 35 studies and concluded that EMA is generally feasible and well-accepted by patients. Findings indicate that suicidal thoughts and behaviors can fluctuate widely over short periods, with negative affect and disturbed sleep emerging as short-term predictors. The review suggests that EMA is a potentially useful tool in clinical practice for understanding and monitoring suicide risk, though it also notes challenges such as participant fatigue and ethical concerns.
7. <https://journals.sagepub.com/doi/full/10.1177/2055207620963958> - This systematic review investigates the daily risk factors of suicide and self-harm through the use of ecological momentary assessments (EMA). EMA involves self-monitoring techniques using mobile technologies to understand daily fluctuations in suicidal thoughts and behaviors. The review included 49 studies and found associations between daily affect, rumination, and interpersonal interactions with non-suicidal self-injury. It also observed links between daily negative and positive affect, social support, sleep, and a person's history of suicide and self-harm. The review concludes that EMA has the potential to help clinicians understand daily predictors of suicide and self-harm, though it calls for standardized reporting and further research using longitudinal designs and machine learning techniques to identify patterns of proximal risk factors.