

Review

Digital Psychopathology as an Aspect of Personal Digital Well-Being

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Citation: Dvoryankina, M.A.; Ivankova, D.L. Digital Psychopathology as an Aspect of Personal Digital Well-Being. *Personalized Psychiatry and Neurology* 2025, 5 (3): 13-17. <https://doi.org/10.52667/2712-9179-2025-5-3-13-17>

Chief Editor: Nikolaj G. Neznanov, D Med Sci, Professor

Received: 28 August 2025

Accepted: 12 September 2025

Published: 15 September 2025

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Abstract: The digitalization of contemporary life exerts a profound influence on mental health, creating both new challenges and opportunities for psychiatric practice. This article examines the phenomenon of digital psychopathology as a component of individual digital well-being. Particular attention is devoted to the methodology of Ecological Momentary Assessment (EMA), which enables the real-time recording of psychological states and behaviors. The advantages of EMA for the diagnosis and monitoring of mental disorders are outlined, as are its methodological and practical limitations.

Keywords: *disorganized thinking, schizophrenia, artificial intelligence, psychiatric assessment, cognitive disruption, neuroimaging.*

1. INTRODUCTION

The digitalization of daily life means that digital technologies are now embedded in nearly every sphere of human activity, thereby shaping what can be termed personal digital well-being [1,2]. This transformation opens new horizons for the study of psychopathology, making it increasingly relevant to move beyond conventional diagnostic models toward a more personalized approach. Yet both Russian and international psychiatric practice still lack sufficient reliable information on how information technologies can be used for high-quality diagnosis and for selecting effective therapeutic interventions for mental disorders.

The purpose of the present article is to provide a theoretical review of the current state of research on digital psychopathology within the broader context of digital well-being. Careful analysis of different facets of mental health allows not only the implementation of preventive measures but also the individualization of treatment through the use of virtual environments and digital tools. One such tool, Ecological Momentary Assessment (EMA), serves as the primary focus of this study. EMA represents a complex system that integrates technological platforms, real-time assessment methodology, and statistical analysis of the data collected [3].

2. OBJEKTIVE

The main purpose of the work is to provide a theoretical review of the current state of digital psychopathology within the framework of digital well-being, with a particular focus on the methodology of Ecological Momentary Assessment (EMA). The paper highlights how EMA enables personalized analysis of symptoms, supports preventive and therapeutic measures, and contributes to the development of individualized models of psychiatric care.

3. MATERIALS AND METHODS

A narrative review approach was applied. Publications from PubMed, Scopus, Web of Science, eLibrary, and Google Scholar were analyzed up to mid-2025. Search key-words

included: digital psychopathology, Ecological Momentary Assessment, digital well-being, psychiatric assessment, mental disorders.

Articles were selected if they addressed the role of digital technologies in psychopathology, methodological aspects of EMA, or the clinical application of digital monitoring tools.

The selection process focused on studies providing empirical data, theoretical reviews, or practical evaluations relevant to the integration of EMA into psychiatric and psychotherapeutic practice. Priority was given to peer-reviewed articles and systematic reviews.

4. RESULTS

4.1. Positive and negative effects of digital technologies on mental health

Examining both the beneficial and adverse effects of information technologies in mental health care is essential, as is understanding the constraints posed by the nature of specific disorders and by ethical, financial, and methodological considerations. Addressing these questions can substantially enhance psychological well-being by improving the quality of specialized care. Information technologies make it possible to detect not only predictors of mental disorders but also the subtle symptoms and symptom complexes that constitute the phenotypic heterogeneity of clinical presentations.

The rationale for using IT in psychiatry is closely linked to the hybridization of contemporary environments, in which virtual spaces contribute to the individual's major life choices, the structuring of life experiences, the formation of goals, values, and attitudes, as well as processes of self-identification and the experience of personal continuity [4,5]. This environment is shaped by social networks and other platforms that facilitate human communication within vast, often contradictory, and not always factually verified information flows. Together, these elements form a dynamic system characterized by stable self-reinforcing loops.

4.2. Ecological momentary assessment: concept and application

The use of digital technologies-particularly EMA-offers unique opportunities for psychopathology research and clinical practice. EMA simplifies the transition to dimensional and personalized models of psychopathology, where symptoms are analyzed as continuous scales, interconnections, and dynamic changes. Data are collected in real time, avoiding the distortions of retrospective reporting, and enabling the tracking of behaviors and experiences within the patient's natural environment. Symptom dynamics can thus be monitored with high temporal and contextual precision, and relationships between symptoms can be analyzed both in individual and population samples.

EMA is a methodology designed to capture psychological states and behaviors as they occur in everyday life. Its central premise is to replace retrospective generalizations with situational, real-time self-observations repeated throughout the day. For example, a patient might receive several brief surveys daily via a mobile application or other wearable device. Each assessment can include five to fifteen items covering current affective state, bodily sensations, motivation, conscious activity, cognitive processes, and the nature of social interactions.

Different EMA formats have been described:

- signal-contingent, in which prompts follow a predefined schedule;
- randomized, in which assessments occur at unpredictable times;
- event-contingent, initiated by the patient after specific experiences or behaviors.

Unlike traditional assessment tools-such as standardized self-report scales (e.g., the Beck Depression Inventory or the PANSS for schizophrenia), which provide only averaged snapshots over days or weeks-EMA records experiences at the moment they arise

[6]. Standardized instruments, despite their validation, remain vulnerable to memory biases, overgeneralization, and inertia, whereas EMA allows clinicians to observe the internal dynamics of symptoms, obtain real-time data, and analyze the individualized course of illness.

4.3. Clinical utility of EMA

International studies have identified clinical contexts where EMA is particularly valuable. These include:

- depression – tracking diurnal fluctuations in mood, fatigue, and hopelessness;
- bipolar disorder – detecting early indicators of phase shifts;
- borderline personality disorder – monitoring affective instability and impulsivity;
- anxiety disorders – identifying situational triggers, intensity of tension, and behavioral responses;
- eating disorders – examining relationships between emotions and disordered eating behaviors such as bingeing, restriction, or compulsions.

Empirical findings highlight several key advantages of EMA:

- high temporal resolution – data are collected throughout the day, increasing the reliability of observations.
- access to microdynamics of symptoms – transitions between states (e.g., anxiety → irritability → self-blame) become visible, deepening understanding of intrapersonal patterns.
- contextual precision – EMA helps pinpoint the exact circumstances that trigger symptoms.
- basis for personalized models – individualized “symptom maps” can be constructed to reveal unique connections between states for each patient [4].

4.4. Technological implementation

EMA is typically deployed via mobile applications equipped with customizable chatbots that allow researchers and clinicians to adjust survey protocols, notification frequency, and secure data export. Physiological parameters can be recorded through wearable devices-smartwatches, fitness trackers-that synchronize seamlessly with EMA reports.

Although most published work describes EMA as a data-gathering method for research rather than a stand-alone diagnostic tool [7], the integration of these instruments into routine psychiatric and psychotherapeutic practice has accelerated in recent years.

4.5. Advantages of EMA over traditional assessment methods

Compared to traditional approaches-where clinical evaluations are typically spaced a week or more apart-Ecological Momentary Assessment (EMA) provides continuous, fine-grained monitoring of a patient’s symptoms and mood. Because patients report their state in their natural environment without the pressure of a clinical session, the data are more objective and reflect the true dynamics of daily life. Frequent measurements capture fluctuations that would be missed by retrospective questionnaires [8].

Through temporal (time-series) analysis, EMA enables the identification of factors that consistently precede symptom exacerbation-whether external (e.g., overload, conflict, sleep deprivation) or internal (e.g., rumination, self-blame). This makes predictive psychiatry more feasible and actionable. Rather than merely suspecting that stress worsens their condition, patients can observe statistically supported links between events and symptoms.

Moreover, EMA supports personalized therapy planning. Instead of basing interventions solely on categorical diagnoses, clinicians can tailor treatment to the unique symptom network of each individual. Intervention protocols can be adjusted to target key

nodes in that network—for example, emphasizing arousal regulation, cognitive distortions, or maladaptive behavioral responses [9, 10].

Finally, EMA facilitates evaluation of therapeutic effectiveness through network analysis. Progress is reflected not only in lower scores on standardized scales but also in structural changes in the patient's symptom network—such as weakened pathological connections, reduced network density, and the emergence of new regulatory symptoms (for instance, calmness or social engagement acting as “buffers”) [10].

4.6. Digital Psychopathology as an Active Therapeutic Component

Taken together, these features indicate that digital psychopathology—understood as the integration of real-time digital monitoring into clinical practice—is not merely a diagnostic or monitoring tool. It functions as an active element of therapy, enabling the construction of flexible, adaptive, and evidence-based strategies for psychiatric care.

4.7. Key challenges in Implementation

Despite its clear potential, the application of EMA in psychiatry presents a series of challenges that span technical, clinical, and ethical domains:

- *data reliability*: EMA applications must function seamlessly across diverse devices and platforms, even under conditions of intermittent connectivity, variable patient engagement, and complex patterns of daily activity. Technical failures are a common source of incomplete datasets, particularly among patients with borderline or bipolar spectrum disorders [11];
- *technology access*: not all patients possess smartphones, stable internet connections, or sufficient digital literacy; this limitation is especially acute among older adults, individuals with severe mental disorganization, and socially vulnerable populations [12];
- *privacy and data protection*: collecting real-time information—potentially including location, physiological parameters, and behavioral activity—demands rigorous encryption standards and transparent ethical oversight; multi-layered data security and clear consent procedures are essential [13, 14];
- *participant burden and fatigue*: patients, particularly those in acute distress, may experience survey fatigue, heightened anxiety from continuous symptom tracking, or a sense of “research pressure”; excessive prompting risks decreased adherence [15];
- *symptom hyperawareness* (“symptomophobia”): constant focus on symptoms can increase hypervigilance and ruminative tendencies, reinforcing anxiety and self-monitoring behaviors.

These challenges underscore that while digital psychopathology significantly augments the clinician's capabilities, it does not replace the clinician. EMA provides unprecedented levels of analysis, but its success depends on critical judgment, empathy, and clinical intuition.

5. DISCUSSION

Digital psychopathology should not be considered solely a diagnostic or monitoring tool but rather an active component of psychiatric treatment. The integration of methodologies such as EMA into clinical practice enables a transition toward dimensional and personalized approaches. EMA allows symptomatology to be evaluated in terms of continuous scales, interrelations, and dynamic changes rather than static diagnostic categories.

The potential of EMA lies in its ability to capture intra-individual variability and symptom networks, enhance predictive psychiatry by identifying precursors of clinical deterioration, and support therapy personalization by targeting central nodes within individual symptom networks [9, 10]. Moreover, EMA provides the possibility to evaluate therapeutic effectiveness not only through score reduction but also via structural changes

in symptom networks - for example, reduced density, lower centrality of pathological nodes, or the emergence of protective nodes such as calmness or social activity [10].

Nevertheless, the application of EMA in psychiatry requires cautious implementation. Technical limitations, unequal access to devices, patient adherence issues, and ethical concerns (including data privacy and patient autonomy) must be addressed. Importantly, digital psychopathology should augment clinical expertise without replacing the psychiatrist's judgment.

Thus, digital psychopathology represents a promising but complex frontier that requires methodological rigor, ethical responsibility, and continuous integration of clinical in-sight.

Author Contributions: Conceptualization, M.A.D. and D.L.I.; methodology, M.A.D.; formal analysis, D.L.I.; investigation, M.A.D. and D.L.I.; data curation, M.A.D.; writing-original draft preparation, M.A.D. and D.L.I.; writing-review and editing, M.A.D.; project administration, M.A.D. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES:

- Mayiwar, L.; Asutay, E.; Tinghög, G.; Västfjäll, D.; Barrafreem, K. Determinants of digital well-being. *AI & Society*, **2024**, 1–11. <https://doi.org/10.1007/s00146-024-02071-2>
- Dienlin, T.; Johannes, N. The impact of digital technology use on adolescent well-being. *Dialogues in Clinical Neuroscience*, **2020**, 22:135–142. <https://doi.org/10.31887/DCNS.2020.22.2/dienlin>
- Mink, F.; Lutz, W.; Hehlmann, M.I. Ecological momentary assessment in psychotherapy research: A systematic review. *Clinical Psychology Review*, **2025**, 117:102565. <https://doi.org/10.1016/j.cpr.2025.102565>
- Mettini, E. Hybrid socialization: The intertwining of virtual and real in the context of modern education. *Educational Technologies*, **2024**, 4(26):74–82.
- Soldatova, G.U.; Rasskazova, E.I. Results of digital transformation: From online reality to mixed reality. *Cultural-Historical Psychology*, **2020**, 1(4): 87–97.
- Targum, S.D.; Sauder, C.; Evans, M.; Saber, J.N.; Harvey, P.D. Ecological momentary assessment as a measurement tool in depression trials. *Journal of Psychiatric Research*, **2021**, 136:256–264. <https://doi.org/10.1016/j.jpsychires.2021.02.012>
- Yin, H.; Zhu, H.; Gu, J.; Qin, H.; Ding, W.; Guo, N.; Fu, J.; Yang, Y. Mobile-based ecological momentary assessment and intervention: Bibliometric analysis. *Frontiers in Psychiatry*, **2024**, 15:1300739. <https://doi.org/10.3389/fpsyt.2024.1300739>
- Abplanalp, S.J.; Reavis, E.A.; Le, T.P. Applying continuous-time models to ecological momentary assessments: A practical introduction and demonstration with clinical data. *NPP - Digital Psychiatry Neuroscience*, **2024**, 2(2). <https://doi.org/10.1038/s44277-024-00004-x>
- Tseng, W.L.; Naim, R.; Chue, A. Network analysis of ecological momentary assessment identifies frustration as a central node in irritability. *Journal of Child Psychology and Psychiatry*, **2023**, 64(8):1212–1221. <https://doi.org/10.1111/jcpp.13794>
- Castro, D.; Gysi, D.; Ferreira, F.; Ferreira-Santos, F.; Ferreira, T.B. Centrality measures in psychological networks: A simulation study on identifying effective treatment targets. *PLOS ONE*, **2024**, 19(2):e0297058. <https://doi.org/10.1371/journal.pone.0297058>
- Doryab, A.; Freed, D.; Liu, L.; Luo, R. Digital phenotyping in psychiatry: Bridging smartphone data to clinical features. *Molecular Psychiatry*, **2022**. <https://doi.org/10.1038/s41380-022-01795-1>
- Burke, L.; Naylor, G. Smartphone app-based noncontact ecological momentary assessment with experienced and naïve older participants: Feasibility study. *JMIR Formative Research*, **2022**, 6(3):e27677. <https://doi.org/10.2196/27677>
- Stone, A.A.; Schneider, S.; Smyth, J.M. Evaluation of pressing issues in ecological momentary assessment. *Annual Review of Clinical Psychology*, **2023**, 19:107–131. <https://doi.org/10.1146/annurev-clinpsy-080921-083128>
- Byrne, M.E.; Bernstein, R.A.; Pine, D.S.; Kircanski, K. Ecological momentary assessment of youth anxiety: Evaluation of psychometrics for use in clinical trials. *Journal of Child and Adolescent Psychopharmacology*, **2023**, 33(10):409–417. <https://doi.org/10.1089/cap.2023.0025>
- Singh, S.; Strong, R.; Xu, I. Ecological momentary assessment of cognition in clinical and community samples: Reliability and validity study. *Journal of Medical Internet Research*, **2023**, 25:e45028. <https://doi.org/10.2196/45028>
- Birk, R.H.; Samuel, G. Digital phenotyping for mental health: Reviewing the challenges of using data to monitor and predict mental health problems. *Current Psychiatry Reports*, **2022**, 24(10): 523–528. <https://doi.org/10.1007/s11920-022-01358-9>