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The experience sampling methodology as a digital clinical tool for more person-centered mental health care: an implementation research agenda

Editorial

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Abstract

This position paper by the international IMMERSE consortium reviews the evidence of a digital mental health solution based on Experience Sampling Methodology (ESM) for advancing person-centered mental health care and outlines a research agenda for implementing innovative digital mental health tools into routine clinical practice. ESM is a structured diary technique recording real-time self-report data about the current mental state using a mobile application. We will review how ESM may contribute to (1) service user engagement and empowerment, (2) self-management and recovery, (3) goal direction in clinical assessment and management of care, and (4) shared decision-making. However, despite the evidence demonstrating the value of ESM-based approaches in enhancing person-centered mental health care, it is hardly integrated into clinical practice. Therefore, we propose a global research agenda for implementing ESM in routine mental health care addressing six key challenges: (1) the motivation and ability of service users to adhere to the ESM monitoring, reporting and feedback, (2) the motivation and competence of clinicians in routine healthcare delivery settings to integrate ESM in the workflow, (3) the technical requirements and (4) governance requirements for integrating these data in the clinical workflow, (5) the financial and competence related resources related to IT-infrastructure and clinician time, and (6) implementation studies that build the evidence-base. While focused on ESM, the research agenda holds broader implications for implementing digital innovations in mental health. This paper calls for a shift in focus from developing new digital interventions to overcoming implementation barriers, essential for achieving a true transformation toward person-centered care in mental health.

Over the last decade, mental health care transitioned from hospital-focused to community-based services and shifted its treatment objectives from mere symptom reduction to personally defined recovery (Slade et al., 2014). Despite these advancements, mental health care has yet to fully embrace a person-centered approach, which advocates for 'the provision of holistic, biopsychosocial, or integrative care that is responsive to people's needs and values, …, that empowers them and offers choice, involvement and a partnership approach' (Boardman & Dave, 2020). However, service users of mental health care are often treated as passive recipients of care and shared decision-making practices remain limited (Slade, 2017). This is problematic, given that similar to what is expected in somatic health care (McMillan et al., 2013; Santana et al., 2018), engaging service users as active partners in their treatment will improve engagement with their care, help them manage their mental health problems better, and help clinicians target the treatment closer to the needs of the individual service user, while jointly deciding the next steps in the treatment.

Digital health technologies could facilitate the transition to person-centered mental health care (Leonardsen, Bååth, Helgesen, Grøndahl, & Hardeland, 2023), although empirical research in this domain remains sparse (Ibrahim et al., 2022). Moreover, despite the rapid evolution of digital mental health innovations, their clinical adoption in psychiatry and a clear understanding of the barriers to implementation and use remain limited (Torous et al., 2021). This position paper by the international IMMERSE (Implementing Mobile MEntal health Recording Strategy for Europe) consortium aims to review the evidence of a digital mental health solution based on Experience Sampling Methodology (ESM) for advancing person-centered mental health care and outline a research agenda for implementing innovative digital mental health tools into routine clinical practice.

How can digital technology based on ESM advance person-centered mental health care?

The core of distress and impaired functioning related to mental health problems lies in individuals' personal subjective experiences such as feelings of depression or anxiety, difficulties falling asleep, or hearing voices. These experiences and behaviors are situated in, and interact with, the context of individuals' daily lives, implying that experience and behavior are most amenable to change precisely in this context (Myin-Germeys et al., 2018; Reininghaus & Myin-Germeys, 2023). However, both clinicians and service users lack comprehensive, qualitative insights into these real-life experiences. What are the intensity and variability of these experiences over time, what are the real-time moments of risk or resilience, and how are treatment goals effectively integrated into individuals' daily routines? Insights into these daily life processes are essential for effectively (self)managing the illness course and treatment, and making informed and shared decisions. Digital tools can help bridge these gaps by facilitating the collection of relevant real-life information and supporting insight and understanding for services and their users.

In this paper, we will focus on digital tools that are based on ESM (Hektner, Schmidt, & Csikszentmihalyi, 2007; Myin-Germeys & Kuppens, 2021) (also known as Ecological Momentary Assessment [EMA] [Stone & Shiffman, 1994]). ESM is a structured self-report diary technique where service users actively gather real-time information about themselves in their natural environment using a mobile application. Service users are prompted with brief, in-the-moment questionnaires regarding their key problems, symptoms, mood, and context multiple times per day over several consecutive days. These data therefore offer insights into the individual's current mental state and patterns of risk and resilience (Myin-Germeys et al., 2018). Moreover, by actively engaging the service user in the monitoring process, they underscore the potential of ESM to augment person-centered care.

ESM as a digital tool for enhancing person-centered clinical practice: what is the evidence?

Over the past two decades, research has accumulated evidence that using ESM in clinical mental health care may contribute to (1) service user engagement and empowerment, (2) self-management and recovery, (3) goal direction in clinical assessment and management of care, and (4) shared decision-making.

Service user engagement and empowerment

A critical consideration for integrating self-report data into routine healthcare practices pertains to the willingness and capability of service users to engage in self-reporting, along with achieving acceptable compliance levels. A series of studies, including pooled data sets and meta-analytic approaches, have demonstrated that service users can reliably provide self-reports in the flow of daily life using ESM, irrespective of their diagnosis (Myin-Germeys et al., 2009), reaching an average response rate in research studies of 78% (Vachon, Viechtbauer, Rintala, & Myin-Germeys, 2019) and of 70% in people with a diagnosis of psychosis (Rintala, Wampers, Myin-Germeys, & Viechtbauer, 2019). Although compliance may decrease when applied clinically, a pilot study still achieved an acceptable 50% compliance rate in routine mental health care (Weermeijer et al., 2023). Moreover, findings from an app-based study focusing on monitoring early signs to enhance well-being, engagement, and recovery in psychosis, revealed that 91% of service users randomized to the app-based monitoring actively engaged with the app, with observed improvements in mental health outcomes and treatment adherence (Gumley et al., 2020). These data substantiate the potential of ESM for actively engaging individuals in their care.

Furthermore, ESM has been proposed to enhance individuals' insight, understanding, and empowerment. As our ability to report on our emotional and mental states is dependent on our capacity to understand and recognize our internal experiences, self-monitoring enhances our sensitivity to recognize different mood and cognitive states and what may influence them. Qualitative studies with clinicians (Bos, Snippe, Bruggeman, Wichers, & van der Krieke, 2019; Weermeijer, Kiekens, Wampers, Kuppens, & Myin-Germeys, 2024), and service users (de Thurah et al., 2023) have supported this notion. One quantitative study tested this in a clinical trial in individuals with a diagnosis of depression and demonstrated that engaging in daily self-monitoring increased feelings of empowerment (Simons et al., 2015).

Self-management and recovery

Numerous studies have demonstrated that longitudinal self-report data collected through ESM are exceptionally adept at elucidating meaningful patterns of associations, helping service users to better self-manage their mental health problems. For example, these momentary data provide more accurate information compared to retrospective reports and clinical interviews, concerning mood instability (Solhan, Trull, Jahng, & Wood, 2009), relapse (Gumley et al., 2020), functioning (Schneider, Reininghaus, van Nierop, Janssens, & Myin-Germeys, 2017), and quality of life (Leendertse et al., 2018). Furthermore, the iterative nature of assessment enables the identification of dynamic patterns in the variation and co-variation of mood, cognition, behavior, and context over time (Myin-Germeys et al., 2018). For example, in the field of psychosis, real-life increases in anxiety, and decreases in self-esteem have been linked to increases in the intensity of paranoia (Thewissen et al., 2011). However, a closer examination at the individual level revealed that these group findings may not uniformly apply to each individual (Oorschot, Lataster, Thewissen, Wichers, & Myin-Germeys, 2012), underscoring the

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importance of adopting a person-centered approach that facilitates the individual-level understanding of these associations in each person's context. Similarly, ESM research identified altered stress reactivity (Reininghaus et al., 2016), delayed stress recovery (Vaessen et al., 2019), and poor sleep quality as important targets for treatment (Kasanova, Hajdúk, Thewissen, & Myin-Germeys, 2020). These examples underscore how offering personalized feedback on individual patterns of risk and behavior represents a unique tool for personalized psycho-education, insight, and self-management (van Os et al., 2017). Findings from a randomized clinical trial involving patients with chronic depression have demonstrated that providing feedback on specific patterns of behavior can effectively reduce depressive symptoms (Kramer et al., 2014) and induce lasting behavioral changes (Snippe et al., 2016). In another cluster randomized controlled trial involving service users with a psychotic disorder, app-based self-monitoring significantly reduced relapse rates and facilitated symptomatic recovery when compared to routine monitoring (Gumley et al., 2020).

Goal direction in clinical assessment and management of care

The detailed information elucidating the crucial associations among symptoms, key problem areas, and their context, as described above, can also help clinicians tailor treatments towards specific and personalized goals. Nevertheless, there is limited research on its actual application in clinical practice.

In addition, this detailed and fine-grained information may contribute to better management of care, by providing more comprehensive assessments of treatment outcomes, encompassing not only symptom management but also overall well-being and functioning, while facilitating a more nuanced evaluation of possible side effects. Two studies directly comparing ESM measures to retrospective questionnaires in assessing treatment outcomes, found ESM measures to outperform conventional clinical measurements, both among individuals with depression (Moore, Depp, Wetherell, & Lenze, 2016), and psychosis (So, Peters, Swendsen, Garety, & Kapur, 2013). Moreover, ESM data have been shown instrumental in identifying early processes of change that may bear relevance for the further course of treatment. For instance, early improvements in positive affect as measured with ESM during the first week of antidepressant treatment, were found to predict the depression severity and remission after 6 weeks (Geschwind et al., 2011). Additionally, ESM enables a more accurate assessment of treatment side effects, for example by demonstrating a dampening effect of antipsychotic medication on psychotic symptoms and mood in individuals with psychosis (Lataster et al., 2011).

Shared decision-making

A cornerstone of the shared decision-making process is situational diagnosis (Wieringa et al., 2019), wherein the service user's situation is elucidated, and both the service user and clinician reach a mutual understanding of the treatment focus. In mental health care practice, this requires a comprehensive insight into moments of mental risk and resilience by both parties, aiding in the joint identification of indicators of distress and (mal)adaptive patterns of behavior (Slade, 2017). Since ESM can provide relevant and qualitative day-to-day information on key problem areas and pertinent contextual factors essential for treatment decisions and evaluating treatment progress, using ESM would foster agency and true collaborative care driven by the needs of patients (Simblett et al., 2019). Despite some evidence in chronic somatic patients, showing that self-monitoring increased patients' understanding of the illness (Mamykina et al., 2017), scientific evidence for the role of ESM in improving shared decision-making processes is lacking.

Overall, a growing body of evidence demonstrates the value of ESM-based approaches in enhancing person-centered mental health care. However, ESM is hardly integrated into clinical practice. It is crucial to examine the reasons behind this discrepancy. What are the primary barriers and facilitators for the integration of ESM into routine mental health care and how can we harness the full potential of ESM to promote truly person-centered mental health care?

Identifying barriers and facilitators: the role of implementation research

Numerous prior efforts to implement evidence-based digital mental health approaches in clinical settings have encountered setbacks (Mohr, Riper, & Schueller, 2018). There is a growing consensus attributing these failures to a lack of understanding regarding the vast research-to-practice gap and a dearth of targeted research aimed at bridging this gap. The average timeframe for the implementation of evidence-based approaches into clinical (mental) health care spans 15–20 years (Proctor et al., 2009). This underscores the challenge of translating digital interventions in mental health, which demonstrate promising outcomes in efficacy studies conducted in controlled research settings, into sustainable clinical practices (Mohr, Weingardt, Reddy, & Schueller, 2017).

To effectively integrate ESM into routine mental health practice, we need implementation science, to develop, refine, and evaluate implementation strategies specific to ESM. Implementation science in healthcare constitutes an interdisciplinary field of research that complements basic and clinical health studies by prioritizing the translation of evidence-based interventions into healthcare practice (often referred to as the journey 'from bench to bed to practice'). The successful implementation of innovations into (routine) healthcare practice is shaped by a multitude of factors (Strifler et al., 2018), underscoring the inherent complexity involved in introducing novel methodologies such as ESM into real-world clinical settings. Barriers and facilitators for implementation may stem from various sources, including the nature of the intervention itself, the characteristics of the targeted users, and the broader organizational and societal context. Understanding these factors is crucial for developing or selecting dedicated implementation strategies that are tailored and responsive to these contextual nuances (Wensing & Grol, 2019).

A research agenda for implementing ESM in routine mental health care

In the remainder of the paper, we propose a global research agenda for implementing ESM in routine mental health care that targets six key challenges that need to be addressed: (1) the motivation and ability of service users to adhere to the ESM monitoring, reporting and feedback, (2) the motivation and competence of clinicians in routine healthcare delivery settings to integrate ESM in the workflow, (3) the technical requirements and (4) governance requirements for integrating these data in the clinical workflow, (5) the financial and competence related resources related to IT-infrastructure and clinician time, and (6) implementation studies that build the evidence-base.

Understanding and improving the motivation and ability of service users to adhere to the ESM intervention

The successful implementation of novel digital innovations hinges on the willingness and capability of service users to adopt the methodology. Previous research on the broader use of health-related mobile applications indicated that service users are open to adopting a new digital tool if they perceive it as personally relevant (Greer et al., 2019), and seamlessly integrated into their daily routine without imposing stigma (Simblett et al., 2019; Torous, Nicholas, Larsen, Firth, & Christensen, 2018). Crucially, service users must feel that the app empowers them to comprehend and manage their illness (Mamykina, Smaldone, & Bakken, 2015), which can be achieved by providing them with meaningful access to their own data (Ancker et al., 2015). Two qualitative studies with service users on the 'hypothetical' use of ESM in clinical practice, indicated empowerment, shared decision-making, and self-awareness as main advantages, whereas burden, negative impact on symptoms and well-being, and validity were seen as main limitations (Bos et al., 2019; de Thurah et al., 2023). This was corroborated by one implementation pilot study, showing that improved self-insight and self-awareness are clear strengths, whereas burden and lack of personalization are the key caveats (Weermeijer et al., 2023, 2024) Engaging service users more in the development and implementation of ESM-based digital tools is needed to develop a balanced clinical ESM tool that combines the strengths of active engagement and collecting high-frequency data while reducing participant burden and achieving a high level of personalization.

Understanding and improving the motivation and competence of clinicians in routine healthcare settings to integrate ESM into the workflow

The effectiveness of technological advancements in healthcare is intricately linked to the readiness of healthcare professionals to adopt them. Clinicians are more inclined to embrace digital innovations when they are designed as technology-enabled services rather than stand-alone products (Mohr et al., 2017). This approach shifts the focus from the technology to how it integrates within the broader context of the healthcare ecosystem. Clinicians exhibit favorable attitudes towards using digital technology when they contribute to an improvement in the quality of care, without a significant increase in workload (Kerst, Zielasek, & Gaebel, 2020). Notably, one survey study (Piot et al., 2022), and two qualitative studies involving clinicians (Bos et al., 2019; Weermeijer et al., 2023, 2024) identified gaining relevant insights and monitoring the clinical process and treatment as assets of clinically implementing ESM. The interactive use together with the service users was recognized as a notable strength, while challenges such as inadequate training, lack of guidelines, and time constraints were identified as significant obstacles. Interestingly, although personalization was identified as an important requirement (Piot et al., 2022), an implementation pilot study revealed that only a minority of clinicians personalized the ESM approach (Weermeijer et al., 2023, 2024). This underscores the imperative for employing mixed-method approaches to develop comprehensive strategies together with clinicians for integrating ESM and other digital technologies into the clinical workflow.

Identifying the technical requirements

To make ESM clinically actionable, it is essential to derive clinically meaningful insights from the wealth of real-life data. This is not an easy task as the numerous ESM variables can be correlated with themselves and across time, depending on the individual's characteristics and context. Therefore, the development of personalized user-friendly and practical methods for clinical data interpretation is crucial. This entails the creation of a platform capable of running algorithms to extract relevant information for each individual, along with a dashboard presenting easy-to-understand visualizations. Basic, robust, evidence-based statistics can illuminate fundamental properties of both mental health states and the environment, such as the intensity and variability of symptoms, frequency of social isolation, or the allocation of time towards productive goal-directed activities. While more complex statistical methods like network modeling (Epskamp et al., 2018) have been proposed to elucidate intricate patterns, concerns about their validity have been raised by clinicians (Weermeijer et al., 2023, 2024). Indeed, a recent report highlighted significant variability in outcomes when the same data were analyzed using network models by different teams (Bastiaansen et al., 2020), emphasizing the risks of prematurely applying new statistical models in clinical practice. On the other hand, ML solutions that make optimal use of data, e.g. by integrating across data modalities or group-level information can reduce such overfitting phenomena (Koppe, Meyer-Lindenberg, & Durstewitz, 2021). For instance, multimodal ML models for dynamical systems reconstruction that integrate across time series modalities, have already proven to benefit the discovery of mechanisms and improve time series forecasting (Kramer, Bommer, Tombolini, Koppe, & Durstewitz, 2022). Since passive sensor data has repeatedly been demonstrated to be predictive of mental health (Torous et al., 2021), the integration of active and passive data with advanced ML models has the potential to enhance the precision and personalization of ESM in clinical practice. However, the integration of passive and active data into personalized ML models for single patient predictions remains to be demonstrated.

To effectively convey ESM data in a comprehensible manner, easy-to-understand visualizations are crucial. While clinicians have identified the use of visualizations as a strength (Bos et al., 2019), there is limited research on optimizing visualizations of real-life data. A qualitative study with clinicians identified time series, bar charts, and pie charts as usable visualizations, showcasing fluctuations in relevant psychological outcomes (e.g. positive or negative affect), emotions in different contexts, and the frequency of engaging in certain (social) activities (Weermeijer et al., 2023, 2024). However, these are static and aggregate representations. Bringmann, van der Veen, Wichers, Riese, & Stulp (2021) developed a moving presentation of raw data to capture the dynamics in ESM data, but this approach has not been extensively investigated yet. More research is needed to develop intuitive and optimal ways for visualizing dynamic, real-life ESM data.

Another critical aspect of clinical implementation is interoperability, which involves integrating ESM data with existing electronic patient files or hospital systems and making them accessible for obtaining broad consent by service users and, thereby, harnessing this data at scale. Clinician dashboards should seamlessly integrate into existing IT tools and workflows, be easily interpretable, and align with clinicians' preferred treatment approaches (Burton et al., 2016). Achieving this requires the cooperation of healthcare management and their IT services, identifying them as significant stakeholders. Currently, most mobile apps are custom-made for specific studies or clinical settings (Miralles et al., 2020), and not apt for wider scale-up. Unlike in somatic medicine, where numerous countries have developed large-scale initiatives addressing interoperability (Cuggia & Combes, 2019), this is mostly lacking in mental health research, and even more so in mHealth approaches. To transition ESM from a research tool to a clinical device ready for scale-up in practice, specifications for interoperability with the international research community, such as Fast Healthcare Interoperability Resources (FHIR), and integration capabilities with hospital systems and electronic patient repositories need to be developed. This will facilitate the seamless transfer of ESM data within clinical and research settings, enhancing its utility in real-world mental health care scenarios and supporting their sustainable reuse under the FAIR guiding principles for scientific stewardship (van Damme, Löbe, Benis, de Keizer, & Cornet, 2024).

Identifying the anticipatory governance requirements

Several reports have raised significant concerns regarding data privacy, security, and confidentiality in numerous existing mental health apps (Miralles et al., 2020; Zhou, Bao, Watzlaf, & Parmanto, 2019). Recent European regulations, including the General Data Protection Regulation (Regulation (EU) 2016/679) and the Medical Device Regulation (Regulation (EU) 2017/745), have imposed stricter requirements on the technology transfer process to address these concerns (Marelli, Lievevrouw, & Van Hoyweghen, 2020). However, the stricter data quality and safety requirements have complicated the translation of ESM-based apps from research to routine mental health care, due to increased regulatory complexity, but also to a misalignment between the existing regulations and the core values embedded in digital health technologies (Lievevrouw, Marelli, & Van Hoyweghen, 2024). The recent implementation of these EU regulatory changes has therefore resulted in a regulatory grey zone, where existing (mental) health apps have to navigate between being considered 'lifestyle and wellbeing' apps and heavily regulated 'medical' digital applications (Lucivero & Prainsack, 2015). Developing increased reflexivity and awareness concerning the complex and scattered regulatory and policy landscape within which mobile technology operates is essential for realizing true clinical implementation. However, this task is challenging given that the European governance and regulatory framework remains a fragmented ethical, regulatory, and policy landscape, despite ongoing efforts for standardization (Marelli et al., 2020). Thus, understanding and navigating the regulatory and policy space is crucial for ensuring ESM's ethical and responsible use in mental health care.

Determining the economic value of implementing ESM in routine mental health care

An essential prerequisite for clinical implication is understanding the economic value and the financial requirements for the scale-up of the intervention. Clinicians have identified financial constraints as significant barriers to implementation with reimbursement from healthcare insurers potentially aiding the adoption of novel digital tools (Weermeijer et al., 2023, 2024). However, very few studies have evaluated the cost-effectiveness and the actual financial implications of implementing and scaling up ESM in routine mental care. One study suggested that utilizing ESM combined with weekly feedback on behavioral patterns is cost-effective for service users with major depression, with a willingness-to-pay threshold of €50 000 for one additional Quality Adjusted Life Year (QALY) gained (Simons et al., 2017), which is at the lower limit of what is currently viewed as acceptable for gaining a QALY in people with severe mental disorder in Europe and the USA (Eichler, Kong, Gerth, Mavros, & Jönsson, 2004). However, more research is needed to assess the marginal cost of implementing ESM in clinical practice relative to its marginal benefit, expanding current evidence to include also cost-utility analyses (CUA) (Dernovsek, Prevolnik-Rupel, & Tavcar, 2007). This entails calculating the economic cost of delivering the intervention – representing the value of all resources consumed by the intervention, both within and beyond the health system – in relation to the benefits it produces, measured as QALYs. The incremental cost incurred by the intervention is related to QALYs gained attributable to the intervention to compute the incremental cost-effective ratio per QALY. This value can inform the decisions on reimbursements by healthcare insurers and public funders. Furthermore, a budget impact assessment should be conducted to provide policymakers with more meaningful information to assess the affordability and feasibility of scaling up the intervention.

Conducting implementation studies and developing an evidence-base

Despite the lack of evidence being a crucial barrier for clinicians to implement digital innovations in their clinical practice, there is a lack of rigorous testing of the usability and effectiveness of mobile mental health interventions (Miralles et al., 2020). Only 16% of all papers in the review by Miralles et al. (2020) reported findings from an RCT and only 36% of these RCTs (5.7% of total papers) were specifically focused on effect assessment. Thus, more rigorous and extensive testing of these approaches is needed, to provide service users and clinicians with a trustworthy product that they can safely use in clinical practice. There is also very little cross-validation, with only 14% of the apps being used in multiple studies, again pointing to the limited scale-up of existing mobile mental health apps, including the clinical use of ESM. More rigorous effect assessment is therefore needed if we want to transfer ESM from research into practice.

Furthermore, limited research has focused on implementing mobile health solutions in mental health (Proctor et al., 2009). While some studies have identified e-literacy, perspectives of service users and clinicians on app usage, user acceptance and usability, and cost-utility as potential barriers to further implementation and scale-up (Simblett et al., 2019), few studies have delved into strategies for overcoming these barriers.

Utilizing established implementation science frameworks will enable the optimization of implementation strategies and the investigation of implementation processes and outcomes within implementation studies that move beyond previous frameworks of developing and evaluating complex interventions (Skivington et al., 2021), and take the specific requirements of implementing novel technologies into account. In tailoring the ESM application for clinical practice, an initial assessment of anticipated barriers and facilitators influencing implementation can be conducted using the 'non-adoption, abandonment, scaleup, spread, and sustainability'(NASSS) implementation science framework (Greenhalgh et al., 2017). Specifically designed for the implementation of novel technologies, the NASSS framework addresses seven domains: the condition or illness, the technology, the value proposition, the adopter system, the organizations, the wider (institutional and societal) context, and the interaction and mutual adaptation between all these domains over time. By leveraging the NASS framework, implementation strategies for novel technologies like ESM can be effectively optimized and tailored.

The RE-AIM framework encompasses key aspects relevant to evaluating the implementation of novel interventions such as ESM across individual and various ecological levels (e.g. staff, setting, system) (Holtrop et al., 2021). Specifically, this framework assesses Reach (extent of service user participation), Effectiveness (interaction between efficacy and implementation in real-world settings), (c) Adoption in routine clinical care settings, (d) Implementation (delivery of the intervention as intended by clinicians), and (e) Maintenance (integration of ESM into routine care). This, in turn, allows for establishing the public health impact as a central aspect for decision-makers and potential adopters of ESM and, hence, may serve as a direct bridge across the research-to-practice gap (Holtrop et al., 2021).

Alongside the RE-Aim framework, a detailed process evaluation could provide in-depth insight into the implementation and sustainability of ESM in routine clinical care pathways and establish what works, for whom, in what circumstances, in what respects, to what extent, and why, using a realist evaluation framework. The realist evaluation framework allows us to identify configurations of contexts, mechanisms of change, and how these are associated with outcomes of implementation and intervention. It combines the strengths of quantitative and user-based experiences to produce a coherent and plausible explanation. This process evaluation is optimally conducted within existing pathways to care and treatment frameworks, attending to person-, system-, and context-based factors that influence or determine the effective use, implementation, and maintenance of ESM within existing pathways to care and treatment frameworks across different mental health settings.

Conclusion

This position paper highlights the potential of actively monitoring real-life experiences and symptoms using ESM to significantly advance person-centered mental health care, by enhancing empowerment, self-management and recovery, tailoring treatment to individual needs, and goals while promoting shared-decision making. Furthermore, the paper outlines an extensive research agenda, addressing the complexity, and diversity of issues necessary to progress toward true implementation. This research agenda is developed by the IMMERSE consortium, as part of the IMMERSE project, an EU-funded Horizon2020 project (https://immerse-project.eu/). In IMMERSE, we will investigate strategies, processes, outcomes, and costs of implementing ESM-based monitoring in routine mental health care in four European countries, while taking the user and clinician perspective and the regulatory framework into account, in addition to creating the necessary technological innovations. IMMERSE is tailored toward the clinical implementation of ESM in routine mental health care. However, the proposed research agenda holds broader global implications as it applies to the implementation of all kinds of mobile and digital innovations in mental health. This paper serves as a call to action, advocating for a shift in focus from continuously developing new digital interventions to actively addressing barriers and bolstering facilitators for the successful implementation of these interventions in routine mental health care. This shift is essential for achieving a true transformation towards person-centered care in mental health.

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