

Fact sheet

KEY RESEARCH FINDINGS

EVIDENCE-BASED MOBILE HEALTH SOLUTION

Monsenso is an innovation leader in digital health for mental illnesses. Our mission is to empower and inspire individuals, caregivers and care providers, to improve mental health and help society overcome the burden of mental illnesses.

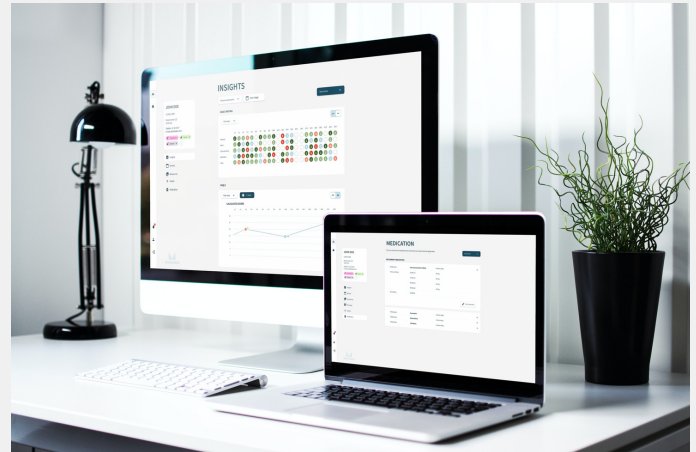
KEY RESEARCH FINDINGS

EVIDENCE-BASED DIGITAL HEALTH SOLUTION

A SOLUTION BASED ON RESEARCH

Monsenso has been involved in more than 20 research projects and more than 70 peer-reviewed articles are published on the use of the solution across different care pathways and research settings. Disorder areas investigated in these trials include depression, bipolar, schizophrenia, anxiety, borderline personality disorder, as well as promotion of mental wellbeing to help avoid the development of mental illness.

Moreover, a number of projects are focused on identifying biomarkers for different disorders.



SERVICE USER EXPERIENCE

- Compared to using paper-based forms, the adherence to self-assessment improves [1,8,17]
- System is considered very easy to use [1,6,17,18]
- High compliance rate - on average 80% to daily registration [2] and patients' individual registrations become more real-time [14,16,18]
- Mobile registrations are less demanding and more discreet for the patient [14]
- Patients use the app to follow their own development, for reflection and to get support and inspiration to handle difficult situations [14,17,18]
- Provides the power to keep a step ahead of their illness [15]
- Assist the power to get appropriate help based on their needs [15]

CLINICIAN EXPERIENCE

- The app makes the therapy less foreign to the patients [14]
- Encourages reflection [18]
- Promotion of dialogue with the therapist - creates a more focused conversation [16,17,18]
- Provides a faster understanding of a new patient [16,17]
- Facilitated easy access to registrations in therapy sessions [17]
- Facilitate the cooperation between patient and clinician [7]

CLINICAL OUTCOMES

- Higher quality of life [9]
- Lower perceived stress [9]
- Early results from a yet unpublished UK trial shows positive effect on:
 - Rumination and worry (PSWQ)
 - Anxiety level (GAD-7)
 - Depression level (PHQ-9)
 - Wellbeing level (WEMWBS)

VALIDITY OF DATA COLLECTION

- Smartphones may reflect an easy and objective way to record illness activity [3]
- An easy and objective method for monitoring of illness activity during long-term naturalistic settings with a low level of intrusiveness [7]
- Smartphone apps represent an easy and objective way to monitor illness activity with real-time data and may serve as an electronic biomarker of illness activity [5]
- Self-monitored depressive symptoms correlated significantly with HDRS-17 items score [3,8,13]
- Daily smartphone-based self-assessed stress is a valid measure of perceived stress [12]
- Sensor data from Smartphone, such as physical and social activity, correlates with clinically rated depressive symptoms [3,8,13]
- Smartphone sensor data may represent a potential diagnostic behavioural marker in bipolar disorder [10,13]
- Forecast mood for several days with low error compared with common baseline methods [11]

KEY RESEARCH FINDINGS

EVIDENCE-BASED DIGITAL HEALTH SOLUTION

CITATIONS

- [1] Bardram, J. E., Frost, M., Szántó, K., Faurholt-Jepsen, M., Vinberg, M., & Kessing, L. V. (2013, April). Designing mobile health technology for bipolar disorder: a field trial of the monarca system. In Proceedings of the SIGCHI conference on human factors in computing systems (pp. 2627-2636).
- [2] System usage analysis. Monsenso, 2018.
- [3] Faurholt-Jepsen, M., Frost, M., Vinberg, M., Christensen, E. M., Bardram, J. E., & Kessing, L. V. (2014). Smartphone data as objective measures of bipolar disorder symptoms. *Psychiatry research*, 217(1-2), 124-127.
- [4] Faurholt-Jepsen, M., Busk, J., Frost, M., Vinberg, M., Christensen, E. M., Winther, O., ... & Kessing, L. V. (2016). Voice analysis as an objective state marker in bipolar disorder. *Translational psychiatry*, 6(7), e856-e856.
- [5] Faurholt-Jepsen, M., Vinberg, M., Frost, M., Christensen, E. M., Bardram, J. E., & Kessing, L. V. (2015). Smartphone data as an electronic biomarker of illness activity in bipolar disorder. *Bipolar disorders*, 17(7), 715-728.
- [6] Frost, M., Doryab, A., Faurholt-Jepsen, M., Kessing, L. V., & Bardram, J. E. (2013, September). Supporting disease insight through data analysis: refinements of the monarca self-assessment system. In Proceedings of the 2013 ACM international joint conference on Pervasive and ubiquitous computing (pp. 133-142).
- [7] Faurholt-Jepsen, M., Vinberg, M., Frost, M., Debel, S., Margrethe Christensen, E., Bardram, J. E., & Kessing, L. V. (2016). Behavioral activities collected through smartphones and the association with illness activity in bipolar disorder. *International journal of methods in psychiatric research*, 25(4), 309-323. <https://doi.org/10.1002/mpr.1502>
- [8] Faurholt-Jepsen, M., Munkholm, K., Frost, M., Bardram, J. E., & Kessing, L. V. (2016). Electronic self-monitoring of mood using IT platforms in adult patients with bipolar disorder: a systematic review of the validity and evidence. *BMC psychiatry*, 16(1), 1-14.
- [9] Faurholt-Jepsen, M., Frost, M., Christensen, E., Bardram, J., Vinberg, M., & Kessing, L. (2020). The effect of smartphone-based monitoring on illness activity in bipolar disorder: The MONARCA II randomized controlled single-blinded trial. *Psychological Medicine*, 50(5), 838-848. doi:10.1017/S0033291719000710
- [10] Faurholt-Jepsen, M., Busk, J., Þórarinsdóttir, H., Frost, M., Bardram, J. E., Vinberg, M., & Kessing, L. V. (2019). Objective smartphone data as a potential diagnostic marker of bipolar disorder. *Australian & New Zealand Journal of Psychiatry*, 53(2), 119-128.
- [11] Busk J, Faurholt-Jepsen M, Frost M, Bardram J, Vedel Kessing L, Winther O (2020). Forecasting Mood in Bipolar Disorder From Smartphone Self-assessments: Hierarchical Bayesian Approach. *JMIR Mhealth Uhealth* 2020;8(4):e15028 URL: <https://mhealth.jmir.org/2020/4/e15028> DOI: 10.2196/15028
- [12] Þórarinsdóttir, H., Faurholt-Jepsen, M., Ullum, H., Frost, M., Bardram, J. E., & Kessing, L. V. (2019). The validity of daily self-assessed perceived stress measured using smartphones in healthy individuals: cohort study. *JMIR mHealth and uHealth*, 7(8), e13418.
- [13] Melbye, S. A., Stanislaus, S., Vinberg, M., Frost, M., Bardram, J. E., Sletved, K., ... & Kessing, L. V. (2021). Mood, activity, and sleep measured via daily smartphone-based self-monitoring in young patients with newly diagnosed bipolar disorder, their unaffected relatives and healthy control individuals. *European Child & Adolescent Psychiatry*, 30(8), 1209-1221.
- [14] Hansen L, and Lakman J (2017): "DAT Projektet - Mobilløsning til patienter i dialektisk adfærdsterapi". Region Seeland's Psychiatry.
- [15] Terp M, Jørgensen R, Laursen BS, Mainz J, Bjørnes CD. "A Smartphone App to Foster Power in the Everyday Management of Living With Schizophrenia: Qualitative Analysis of Young Adults' Perspectives". *JMIR Ment Health*. 2018 Oct 1;5(4):e10157. doi: 10.2196/10157. PMID: 30274966; PMCID: PMC6231723.
- [16] Region Southern Denmark's Psychiatry. "Evaluering af Monsenso i OPUS Esbjerg og Aabenraa". Telepsychiatric Center, 2016.
- [17] Kristine Tarp, Trine Theresa Holmberg, Anne Marie Moeller & Mia Beck Lichtenstein (2022) Patient and therapist experiences of using a smartphone application monitoring anxiety symptoms, *International Journal of Qualitative Studies on Health and Well-being*, 17:1, 2044981, DOI: 10.1080/17482631.2022.2044981
- [18] Austin, S. F., Frøsig, A., Buus, N., Lincoln, T., von Malachowski, A., Schlier, B., ... & Simonsen, E. (2021). Service User Experiences of Integrating a Mobile Solution (IMPACHS) Into Clinical Treatment for Psychosis. *Qualitative Health Research*, 31(5), 942-954.