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Utilizing Smartphones as an Effective Way to Support Patients with Bipolar Disorder: Results of the Monarca Study

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BACKGROUND: Bipolar disorder is characterized by depressive and manic episodes, each with its own specific outcomes. To guarantee the best therapy it is important and necessary to assess the episodes of the disease and its exact degree of severity at an early stage.

METHODS: During a time period of 12 weeks, 9 patients suffering from bipolar disorder were provided with a commercially available smartphone in order to collect behavioral patterns by the phone's internal sensors. These sensors included acceleration, GPS-traces, phone-call behavior and sound. During the trial the patients were also asked to fill out a daily self-assessment questionnaire that included a self-rating. Additionally, to gain ground truth psychological state examinations were performed every three weeks.

RESULTS: The sensor traces are very similar to the diagnosed scores and thus clearly provide an accurate representation of the patient's state. Further, our data suggest a strong empirical evidence that the sensor based data are, on average, a more reliable and objective way of monitoring the mental state and mood than the patient's self-assessment.

CONCLUSION: The MONARCA system introduces new opportunities for the treatment of patients with bipolar disorder. The acquired data allow for identifying changes in the patient's condition at an early stage and therefore support the timely intervention by psychiatrists.