

MoodMon – AI based monitoring tool supporting treatment of affectively disordered out-patients. Early results of the clinical study.

Summary

Introduction: The MoodMon study aims to test the effectiveness and safety of an artificial intelligence (AI) based tool to monitor out-patients diagnosed with bipolar disorder (BD) or recurring depression (RD). It analyzes the behavioral markers gathered from patients via wearables and provides predictions of possible changes in the patient's mental state.

Material and methods: MoodMon study started in May 2021. 100 patients in the age between 18 and 65 years were enrolled: 75 diagnosed with BP and 25 with RD. During the first year of observation system was gathering data to train AI models.

Results: Since Aug. 2022 the system is issuing daily assessment of each patient in form of an alert sent out in case of detecting approach of possible change in the patient's mental state. Up to date system generated 1132 alerts evaluated by psychiatrists. The default decision threshold to raise the alert was purposefully set very low (3,5% of probability) to achieve higher rate of statistical errors of type one: false positive alarms and minimize the risk of false negative results, i.e., lack of alert when due. Alerts caused by patient's behavior changes due to a reason other than the mental state alteration are also considered correct. Preliminary results of the system sensitivity (TPR) and specificity (TNR) are: TPR=85,97% and TNR=98,61%. Moreover, the study has the additional objective of collecting anonymous data to help further research into the course of the disease and new therapies.

Conclusions: The preliminary results of the study are very promising and further analyzes will be carried out on larger amounts of data. The MoodMon application is rated by patients as helpful in monitoring their mental state.

Key words: bipolar disorder (BD), recurring depression (RD), mobile application, artificial intelligence (AI), machine learning,