

## Psychiatry as a leader of contemporary telemedicine in Poland



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Telemedicine, depending on the definition, is an old and new concept in medicine. The early form of telemedicine in psychiatry involved contacting patients using a wire phone or sending them text messages. General access to the Internet and development of new technologies changed telemedicine into a modern and multi-factor form of treatment.

The contemporary definition of telemedicine is the usage of any electronic technology that allows remote diagnosis and treatment of patients. Telemedicine is a form of telemetry, where the data recorded by various electronic sensors is sent to a central computer and collected. Development of the modern GSM technology gave the possibility of easy-to-access videoconferencing connection between the patient and the physician. Telemedicine also uses different smartphone applications, created for the treatment and collection of health-related data, useful for the therapeutic process.

In 2003, after 1 year of e-mail consultations on the Internet platform *Poradnik Medyczny*, I published my first telemedicine research in the journal *Psychiatria Polska*. In the title of the article, I proposed to use the Polish term *telepsychiatria*, and it was rejected in the review process as non-existent in Polish vocabulary. Finally, the journal accepted it, believing that the term *telepsychiatria* could become popular in the coming years. Today the journal takes the honor of the first Polish journal to use the term telepsychiatry in Poland [1].

In 2011 I started preparing the project of a new telepsychiatric smartphone/tablet application for psychiatric treatment. The application was designed to connect various therapeutic modules such as videoconferencing, treatment compliance, cognitive training, psychometric assessment and video education in one application. In 2012 the grant from NCBIR opened the opportunity to develop the smartphone and tablet applications and

conduct a one-year clinical trial to assess the effectiveness of telepsychiatric treatment in schizophrenia. One may ask why schizophrenia? The assumption of the study was that if the system proves effective in schizophrenia it should be effective in every milder psychiatric disorder.

The study was a multicenter, open-label and randomized trial [2]. A total of 290 patients diagnosed with paranoid schizophrenia were included. One hundred ninety-nine of the studied patients were randomized to the study group and 91 to the placebo group. The age of the patients ranged from 18 to 45 years.

One of the inclusion criteria was that the disease could not last longer than 10 years. Another assumption was that the patients enrolled in the study had to be in a state of symptomatic remission. In schizophrenia that means: 1) the severity of symptoms was not greater than mild and did not affect daily functioning and behavior and 2) the severity of the schizophrenic symptoms were at a mild level for at least 6 months prior to the enrollment.

Exclusion criteria were as follows:

- a co-existing psychiatric condition,
- an unstable mental or physical state,
- participation in another clinical trial in the past 6 months,
- lack of ability to use an electronic device with a touch screen,
- pregnancy or lactation,
- any other reason that, according to the investigator, prevented the individual from participating in a clinical study.

Patients were randomized either to the study group (members received a full version of the telepsychiatric application) or to the placebo group (members received an inactive version of the application with limited functionality).

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Submitted: 21.02.2018; Accepted: 13.03.2018

After enrollment, each patient received a smartphone with the telemedicine platform preinstalled. Each investigator participating in the study was given a tablet with the physician's application, mirroring the patient's one.

The application in the study group reminded the patient to take the medication and to conduct the cognitive training. In this way the therapeutic adherence was assessed [3]. The application gave patients access to videobooks where a physician was explaining principles of the treatment of schizophrenia, mechanisms of psychotropic drugs and their side effects. Investigators assessed the state of patients using the PANSS, CGI and Calgary psychometric scales, available on the touch screen. Throughout the whole study all the patients also visited doctors in the out-patient clinics and they were treated with psychotropic drugs. The dosing of drugs could be changed during the videovisit but the prescription of the drugs was possible only in the real visit. The following schizophrenia symptoms were examined in the study: positive symptoms, general psychopathology, excitement, depression, disorganization, negative and cognitive symptoms.

After one year of telepsychiatric treatment a significant improvement of affective, cognitive and schizophrenia symptoms was observed. The improvement in most symptoms was greater than that in the placebo group, especially in the set of schizophrenia symptoms, meaning that the telemedical treatment is at least not worse than the traditional treatment with no use of the telepsychiatric application on the smartphone.

To assess the stability of the patients, we compared their clinical symptoms measured every month throughout the study. Changes in clinical symptoms during the study (in both study and placebo groups) did not reach the 20% level on the CGI-S and PANSS scales, indicating the similar stability of the clinical condition of patients. There were no differences between the study and placebo groups in number of hospitalizations and out-patient visits.

During the study, a total of 63 adverse events were reported, of which most were related to the technical problems with the application. Concerning serious adverse cases, 7 were related to the device. The majority of device-related cases (5 of 7) were due to device failure.

In general, we showed that telemedical treatment is at least as effective as the traditional treatment with an advantage of the telepsychiatric treatment with regard to affective, cognitive and most schizophrenia symptoms. We proved that the new form of treatment is safe and positively received by psychiatric patients. The study opened a new perspective for remote treatment in psychiatry and may be a useful tool.

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*The authors declare no conflict of interest.*

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