Exploring Complexity in Health: An Interdisciplinary Systems Approach
A. Hoerbst et al. (Eds.)

doi:10.3233/978-1-61499-678-1-117

Patient-Provider Teamwork via Cooperative Note Taking on Tele-Board MED

Anja PERLICH[a,1] and Christoph MEINEL[a]
[a] *Hasso Plattner Institute, University of Potsdam, Germany*

Abstract. There is significant, unexploited potential to improve the patients' engagement in psychotherapy treatment through technology use. We develop Tele-Board MED (TBM), a digital tool to support documentation and patient-provider collaboration in medical encounters. Our objective is the evaluation of TBM's practical effects on patient-provider relationships and patient empowerment in the domain of talk-based mental health interventions. We tested TBM in individual therapy sessions at a psychiatric ward using action research methods. The qualitative results in form of therapist observations and patient stories show an increased acceptance of diagnoses and patient-therapist bonding. We compare the observed effects to patient-provider relationship and patient empowerment models. We can conclude that the functions of TBM – namely that notes are shared and cooperatively taken with the patient, that diagnostics and treatment procedures are depicted via visuals and in plain language, and that patients get a copy of their file – lead to increased patient engagement and an improved collaboration, communication and integration in consultations.

Keywords. Doctor-Patient Relationship, Patient Empowerment, Progress Notes, Patient Access to Records, Clinical Psychology, Computerized Medical Record

1. Introduction

The empowerment of patients is gaining considerable importance across various domains of health care. This concept includes that patients take on more responsibility for their personal health as well as a collaborative relationship with their doctors [1]. Pursuing the goal to actively engage patients in their treatment, we develop an interactive documentation system as an adjunct to talk-based mental health interventions. We present a qualitative study with psychotherapy patients and report the observed effects on patient engagement and patient-provider relationship.

1.1. The interplay of patient-provider relationship and patient empowerment

In the domain of mental health care, a positive patient-provider relationship is known to be a major predictive variable for treatment success [2]. Kim et al. introduced a framework to describe the interaction processes between patient and provider [3]. It consists of the following four dimensions: collaboration ("patient and provider participate in establishing mutual goals and commit to reaching them"), integration ("reducing the power differential between patient and provider and increasing respect

[1] Corresponding Author: anja.perlich@hpi.de

for each other"), empowerment ("patient develops self-confidence and becomes a partner in the decision-making process"), and communication ("information is exchanged and patient-provider bonding occurs"). The classification system by Agarwal and Murinson [4] puts the focus on patient characteristics and builds on the three dimensions of: patient values (beliefs or principles related to personal health and the medical sphere), patient autonomy (involvement in the discussion and decision-making process during the encounter), and patient knowledge (level of medical information a patient has and to which extend it is incorporated in the dialogue). Both approaches ([3], [4]), in combination, highly resonate with the concept of patient empowerment which according to Aujoulat et al. is a process that can be described in two dimensions, focusing either on the patient or on the patient-provider interaction [1].

eHealth technologies are central drivers for a higher patient involvement. However, in mental health care, technology use so far does not improve the patients' personal engagement in the treatment [5]. Therefore we present an electronic documentation tool that allows an active involvement of the patient and usage within the consultation.

1.2. Collaborative medical documentation with Tele-Board MED

The medical documentation system Tele-Board MED builds on Tele-Board, a web-based software system to support creative teamwork [6]. It can be used on a lot of different hardware devices, such as digital whiteboards, laptops, as well as desktop and tablet computers (cf. fig. 1). Patient files can be created and filled with documentation panels. These panels serve as a working space that can be freely edited. The existing features are inspired by analogue whiteboard interactions, such as creating sticky notes, drawing scribbles, including pictures and arranging contents. The users can start with an empty panel or use one of the numerous prepared templates, e.g. with psychotherapy analysis schemes (cf. fig. 2). Figure 1 shows session scenarios where documentation panels are displayed and jointly filled by patient and provider during their discussion.

Figure 1. Therapy session scenes with patient, therapist and different versions of the TBM hardware setup. The documentation panel is shown on a digital whiteboard (left) or as a projection on a wall (right).

2. Methods

The usage of TBM was tested in individual therapy sessions at the psychotherapy inpatient ward of a major university hospital in Germany. In a first step, we closely

observed the situation on site. Building on our findings, we took a qualitative research approach to learn about the effects of TBM usage on patients.

2.1. Observations of daily routines at the psychiatric ward

We began with an observation of the situation as it is at present in order to understand the ward workflows, the responsibilities of the staff, and the patients' daily routines. A member of the research team, who is a psychotherapist in training, directly observed and talked to people, saw patients, attended supervision and team sessions, did case hand-overs with other therapists, and wrote medical reports.

2.2. Action research for in-depth qualitative investigations

Once we had an understanding of the clinical context, we studied the practical usage of TBM together with patients. Therefore, we took the approach of action research, which means "the study of how technology is applied in the real world and the practical consequences of technology-enabled action" [7]. The study design was strongly influenced by the sensitivity of the mental health care domain. In order to avoid disruptive factors, we used neither a third person in an observer role nor did we use video recordings. The observations of TBM's practical consequences on patients were collected by the therapist in form of personal notes. The notes were then classified according to their type (observation, story, or quote) and mapped to the dimensions described in section 1.1.

At present there have been more than 1500 hours of patient-encounters, both when TBM is not used and when it is used along with the setup shown in fig. 1 (right). Ten patients for diagnostics and nine patients in therapeutic treatment (e.g., post-traumatic stress disorder, personality disorder) experienced sessions with TBM so far.

3. Results

In this section, we present our findings about the workflows and human interactions at the psychotherapeutic ward, the altered hardware setup, and patients' reactions to TBM.

3.1. A picture of the psychiatric ward and the integration of Tele-Board MED

The hospital ward offers inpatient treatments for a clientele with rather severe mental illnesses. Each patient is treated by several persons (e.g., therapist for individual sessions, co-therapist, therapists for group-sessions, nursing staff), differing between day and night shifts. Thus, patient information is frequently handed over. Patients stay at the clinic between 2 and 12 weeks. There is a specific treatment program for each day and the particular treatment sessions have lengths of 50 minutes. Before therapists meet their patients in an available treatment room, they stay in a staff room to prepare the encounter. When the treatment session is over, the room is left for the next persons.

Initially, we envisioned a stationary TBM setup tailored to one room with an interactive whiteboard. The insights about the ward workflows made us change the setup to a more basic and flexible one, consisting of a laptop, a projector and a wireless keyboard with touchpad (cf. fig. 1, right vs. left).

3.2. Patients' reactions to the usage of Tele-Board MED

We observed patient feedback of different kinds. Some stated their opinion very explicitly; others showed a certain behavior which led us to informed interpretations.

One patient with a long case history says: "I have had this diagnosis for more than ten years. Thank you so much. For the first time I understand why I get such a diagnosis." Another patient complains that he has received a wrong diagnosis over years. He feels, he is physically ill, not psychologically. After completing the diagnostic sessions with TBM, he defends his psychological diagnosis against a skeptical doctor. In all cases observed so far, where the diagnostic procedure was made transparent with TBM (e.g. with the help of visualization as shown in fig. 2, left), the patients agreed on the diagnosis in the end and embraced corresponding treatments. Another patient was taken over for a couple of sessions with the explicit indication between therapists that he tends to talk at cross purposes – a behavior that might hinder the therapy process. During the treatment sessions with TBM however, there is no sign of such behavior and the patient always answers to the point. When TBM was used, no indicators of patient-therapist conflict have been observed (such as unexcused absence of the patient in a scheduled session or complete therapy drop-out). Quite to the contrary, patients show considerable and uncommon teamwork behavior. Almost every patient helps to arrange the room (adjust the light, close the door, help carry equipment etc.) after three or less sessions with TBM. Furthermore, the German language has a built-in "relationship detector" and two ways of addressing other people. Doctors and patients normally address each other with the official form ("Sie"). However, close acquaintances use the familiar form ("du"). In treatments with TBM, every second patient accidentally addressed the therapist with "du" at least once and immediately excused him or herself for the slip up. We further noted that every third patient spontaneously stated the wish to take home a complete copy of the TBM record. This was not observed in sessions without TBM.

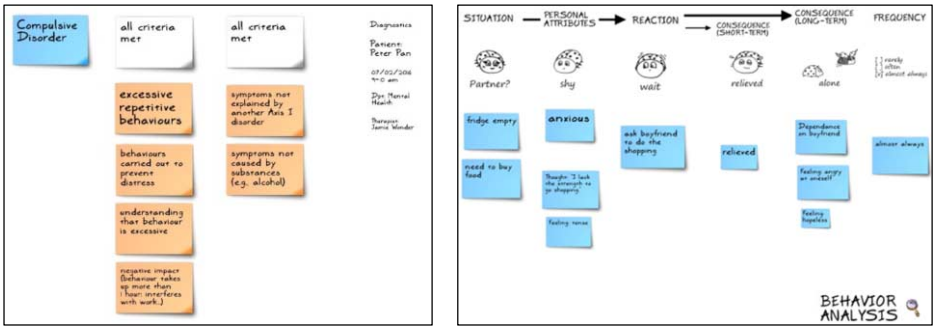

Figure 2. Examples of documentation panels. Left: Template for diagnostics procedure used with patients where compulsive disorder was suspected. Right: Panel for behavior analysis filled with patient information.

4. Discussion

We introduced the interactive documentation system Tele-Board MED to psychotherapy patients in clinical face-to-face therapist encounters. Our qualitative action research study showed very positive and relevant practical effects on patient-provider relationship and patient empowerment (cf. models described in section 1.1.).

The patient cases of better understanding of diagnoses and concordance with therapeutic treatments show an increased *patient knowledge*, a higher consideration of *patient values* as well as an improvement of the *collaboration process*. TBM supports the patient education and reflection on their health situation and personal beliefs. It also fosters the alignment of patient and provider towards a mutual goal. The observations that patients accidentally used the unofficial form of address and helped the therapist to arrange the treatment room strongly indicate a team feeling and thus a manifestation of a positive *communication and integration process*. The case with the patient, who started to answer on the point, illustrates a positive effect on the *communication process*. TBM with its display of information, pictures and templates can spark and guide the discussion. The cases where patients asked for print-outs of session notes to take home show increased *patient autonomy*. All the mentioned factors contribute to the *empowerment process* of the patient. Patients are supported in building knowledge about their health situation and the collaboration with their provider happens at eye-level. While the patient stories and observations are relatable to certain dimensions of the two models ([3], [4]), it is less definite for the specific characteristics of TBM. It is the interplay of the following features that promotes patient empowerment and patient-provider teamwork: the hands-on documentation panels as working space to collect and reflect on data together with the patient, the input modes that foster the use of short text and pictures, the presentation of diagnostics and treatment procedures via visuals and in plain language, and the option to quickly provide patients with an understandable copy of their file. Yet, there are clear limitations to our study. So far, only one therapist used the system with patients. In order to empirically ensure that the effects are caused by the system usage and did not rise due to personality traits or therapeutic style of the therapist, a larger sample of therapists is needed.

Acknowledgment

We would like to express our appreciation to the HPI-Stanford Design Thinking Research Program for the funding of the described project, and we thank all the individuals who made this study possible.

References

[1] I. Aujoulat, W. D'Hoore, A. Deccache, Patient empowerment in theory and practice: polysemy or cacophony?, *J Patient Educ. Couns.* **66**(1) (2006), 13–20.
[2] K. Grawe, Empirisch validierte Wirkfaktoren statt Therapiemethoden, *Rep. Psychol.* **7**(8) (2005), 311.
[3] S.C. Kim, S. Kim, D. Boren, The Quality of Therapeutic Alliance between Patient and Provide Predicts General Satisfaction, *Mil. Med.* **173**(1) (2008), 85–90.
[4] A.K. Agarwal, B.B. Murinson, New dimensions in patient-physician interaction: values, autonomy, and medical information in the patient-centered clinical encounter, *Rambam Maimonides Med. J.* **3**(3) (2012), 1–11.
[5] D. Coyle, G. Doherty, M. Matthews, J. Sharry, Computers in talk-based mental health interventions, *Interact. Comput.* **19**(4) (2007), 545–562.
[6] R. Gumienny, L. Gericke, M. Quasthoff, C. Willems, C. Meinel, *Tele-Board: Enabling efficient collaboration in digital design spaces*, in: Proc. Int. Conf. Computer Supported Cooperative Work in Design (CSCWD), 2011. pp. 352–359.
[7] N. Kock, The Encyclopedia of Human-Computer Interaction, 2nd Ed.: Action Research, https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/action-research-its-nature-and-relationship-to-human-computer-interaction, last acc.: 28.1.2016.