

A glimpse in the future of psychotherapy: The Trier Treatment Navigator application

A digital navigator system designed to support psychological interventions on a day-to-day basis including individual treatment recommendations, risk of dropout, monitoring of suicide risk and treatment progress and support tools for treatment of patients who are not on track. It almost sounds like an episode of black mirror; a Netflix science fiction series about new technologies in the future. However, this is a normal day of a therapist in the psychotherapy clinical in Trier from professor Wolfgang Lutz. I am working together with professor Lutz and colleagues to learn from their experiences with machine learning techniques and use these to combine predictors into individual treatment recommendations for patients with PTSD in The Netherlands. I am fascinated by the work of professor Lutz and colleagues on the use of advanced statistical models to improve clinical practice and especially the way they implemented this in day-to-day treatments and I was fortunate to interview professor Lutz about his work.



What does the trier treatment navigator (TTN) do at the start of treatment?

The TTN is a digital navigation system designed to support psychological interventions on a day-to-day basis. It supports clinical decision-making at the beginning of therapy by giving empirically-based recommendations about the optimal treatment strategy (based on archival data of about 1200 treated patients and machine learning algorithms). For example, would it be better to start treatment with problem-solving techniques or would it be better first to build motivation and focus on the therapeutic relationship? Furthermore, the system provides dropout predictions for each new patient at the beginning of treatment and compares this to the average dropout. It also monitors suicide risk. If necessary, clinicians can then focus on these topics early.

And what does the TTN do during treatment?

In a second step, the TTN monitors clinical progress on a session-by-session level using questionnaire data. The TTN indicates the risk for treatment failure during treatment and makes suggestions to therapists on how to continue treating at-risk patients. For such “not-on-track” cases, therapists are provided with in-depth clinical problem-solving and support tools. Such tools include recommendations and comprehensive clinical material to treat patients at risk, which are easily accessible within the internet portal (including videos, clinical exercises, and worksheets). This comprehensive clinical material covers the following problem areas (1) risk/suicidality, (2) motivation/therapy goals, (3) therapeutic alliance, (4) social support and critical life events as well as (5) emotion regulation/self-regulation. The aim of the navigation system is not to overrule the clinician, but to provide important additional information that can be used to reflect one’s professional work and to consider other potentially new treatment options to improve treatment outcomes. It is therefore important that the system is carefully implemented and therapists are trained in its use.

What about the experiences for therapists?

Our clinicians have received the system very positively. Although, at the beginning before we implemented it, therapists expressed some concerns about a negative impact on the therapeutic relationship. Therapists especially seem to like the clinical support tools, which can be used for patients at risk for treatment failure. We recently even had problems implementing a control group of therapists not using the system, because therapists didn't want to stop using it assigned to the control group.

How is the experience for patients?

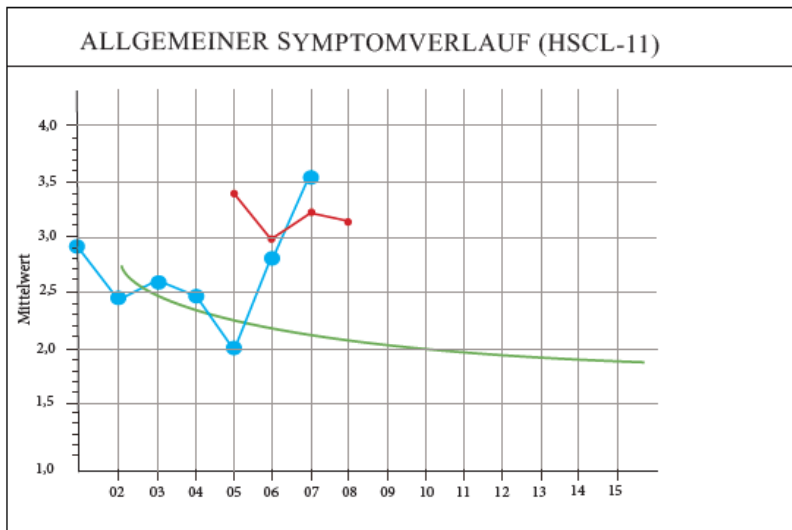
Patients are also positive. When asked how important it is that a clinic evaluate their treatment outcomes, over 90% of patients agree or slightly agree to this statement.

What do you do when TTN indicates big problems for a patient?

Therapists check out the system's recommendations and also bring the patient up at our weekly peer supervision and support group, where such risk patients are discussed.



Feedback für Patient XXYYP01



ALLGEMEINER SYMPTOMVERLAUF



Allgemeiner Symptomverlauf ist nicht erwartungsgemäß.

KLINISCHE UNTERSTÜTZUNGSTOOLS



Risiko / Suizidalität



Motivation / Therapieziele



Therapeutische Beziehung



Soziale Unterstützung / Kritische Lebensereignisse



Emotionsregulation / Selbstregulation

What is the science behind the TTN?

We are continuing to study the effects of the system and are working to constantly improve it. We recently finished a prospective trial with 377 patients. Patient results were better when therapists followed the suggested treatment recommendation at the beginning of treatment. The evaluation of the adaptive module showed that the usage and therapist attitudes towards it as well as self-reported confidence to use it were significant predictors of a positive outcome. This means implementation and training on the use of the system are crucial. In additional studies, Ann-Kathrin Deisenhofer from my group used data from PTSD patients to do differential predictions on Trauma-focused cognitive behavioral therapy (Tf-CBT) and eye movement desensitization and reprocessing (EMDR) and Brian Schwartz published recently a paper on differential predictions for cognitive behavioral and psychodynamic therapy treatments.

Is it sometimes scary to rely on the TTN?

Implementation and training is very important. Several studies from us, but also for example by Kim de Jong in the Netherlands support the idea that therapists' attitudes towards and usage of feedback are important for feedback success.

Being aware of these studies, it is now mandatory for our clinical trainees to take part in training courses on the system before seeing patients in the clinic. In addition, we offer ongoing support on how to use the system during treatment in the context of a peer supervision group. This means that therapists with cases that have been identified by the navigation system as being at risk for treatment failure are invited to take part in a feedback meeting.

At this non-judgmental meeting, therapists can discuss the feedback system's suggestions and reflect on what might be important for them to adapt.

Will the TTN be implemented more broadly?

So far, we have only tested this system in Trier. However, we offer a GitHub Version, which is free for use and allows other investigators to adapt it to their needs. Jaime Delgado at the University of Sheffield, UK tested and implemented a similar system in several IAPT services in the UK.

Can we also do this in The Netherlands?

Of course! Get in touch with colleagues working in this area and adapt existing systems to your needs. I am happy, that your group at Leiden with Willem van der Does, Rianne de Kleine and Kim de Jong also does this kind of research. Marcus Huibers at the Vrije Universiteit Amsterdam is also a leading figure and makes wonderful research in this area. We work on a EU- research proposal together.

Reading suggestions

- Deisenhofer, A.-K., Delgado, J., Rubel, J. A., Böhnke, J. R., Zimmermann, D., Schwartz, B., & Lutz, W. (2018). Individual treatment selection for patients with posttraumatic stress disorder. *Depression and Anxiety, 35*(6), 541–550. <https://doi.org/10.1002/da.22755>
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- Lutz, W., Schwartz, B., Penedo, J. M. G., Boyle, K., Deisenhofer, A.-K. (2020). Working towards the development and implementation of precision mental healthcare – An example. *Administration and Policy in Mental Health and Mental Health Services Research, 47*, 856–861, doi: 10.1007/s10488-020-01053-y
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- Schwartz, B., Cohen, Z. D., Rubel, J. A., Zimmermann, D., Wittmann, W. W., & Lutz, W. (2020). Personalized treatment selection in routine care: Integrating machine learning and statistical algorithms to recommend cognitive behavioral or psychodynamic therapy. *Psychotherapy Research*. <https://doi.org/10.1080/10503307.2020.1769219>