



# Human-Centered Development of an Activity Diary App for People with Depression

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## Introduction

- Depression** is a common and serious mental illness [1, 3, 4].
- Important part of some **therapies**: patient log their activities, emotions and mood with an activity diary.
- Activity Dairies** useful for:
  - Accurate assessment of actual mood (memory is biased by depression).
  - Identifying positive activities.
  - Evaluating treatment.

### Problem

- Diaries are currently done on a **sheet of paper** (see time table sheet on the right) [1].
- Highly inconvenient — specialized apps should be much better (potentials see image on right).

### Question

*How should an activity diary app for people with depression be designed to achieve high usability, acceptance and compliance?*

## Analysis

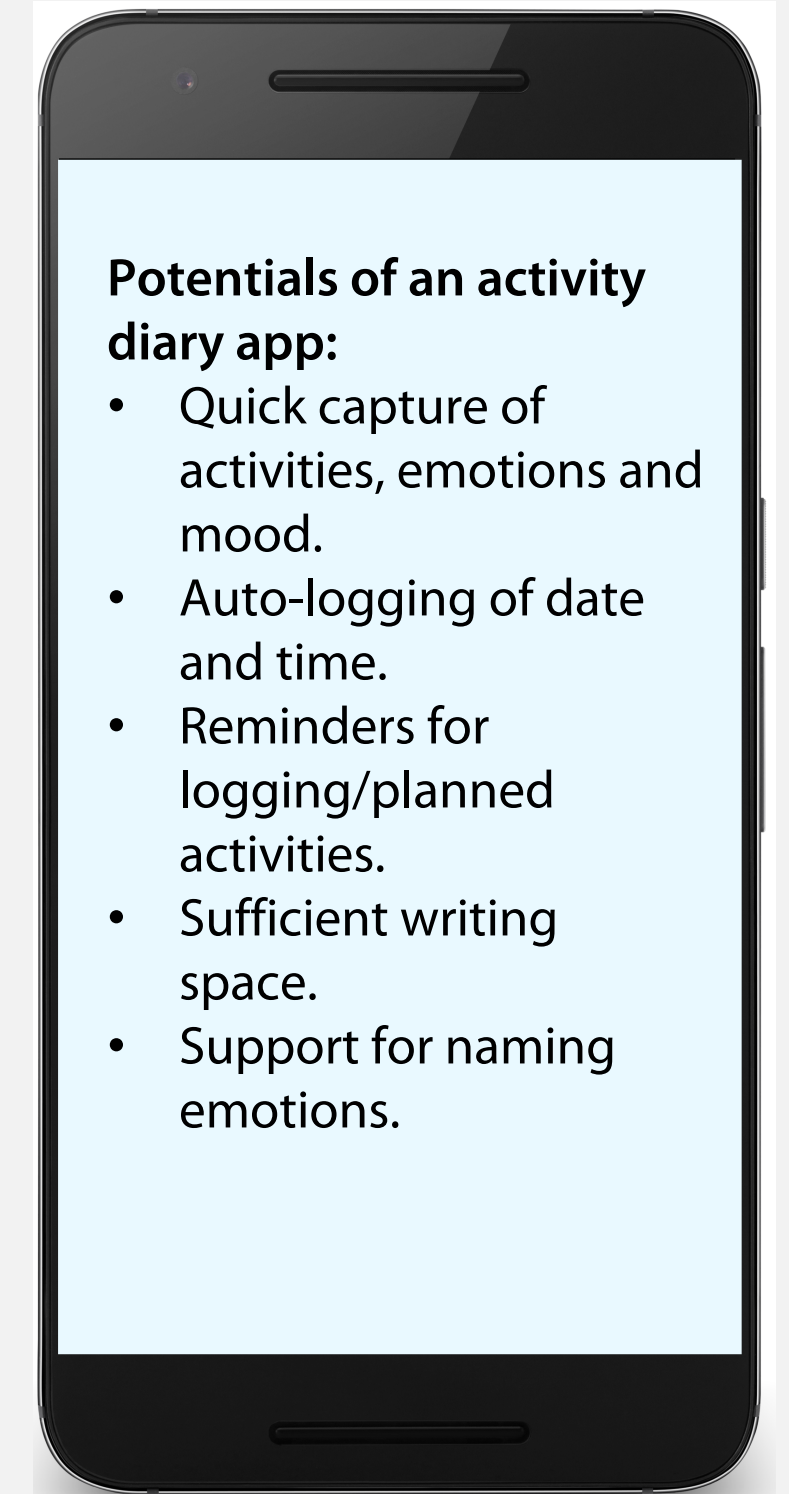
Uhr	Montag	Dienstag	Mittwoch	Donnerstag	Freitag	Samstag	Sonntag
7-8							
8-9							
9-10							
10-11							
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13-14							
14-15							
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16-17							
17-18							
18-19							
19-20							
20-24							

#### Problems of the paper-based activity diary:

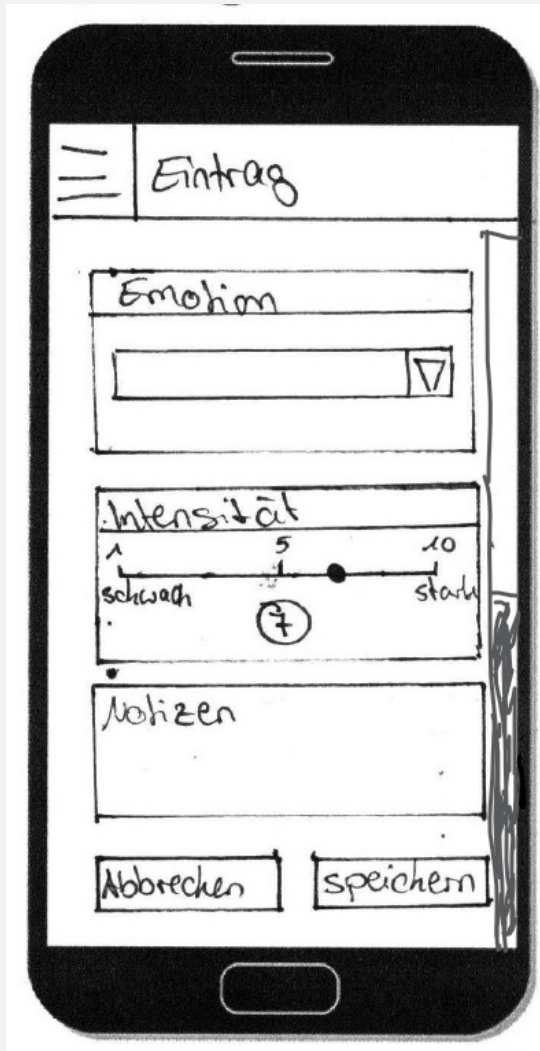
- Space for writing an activity, emotion and intensity is too small.
- No space for planning an activity.
- No reminder function for hourly logging.
- No help naming the emotion.
- Difficult to write in public.
- Writing in public attracts attention (feelings of shame).

#### Consequence

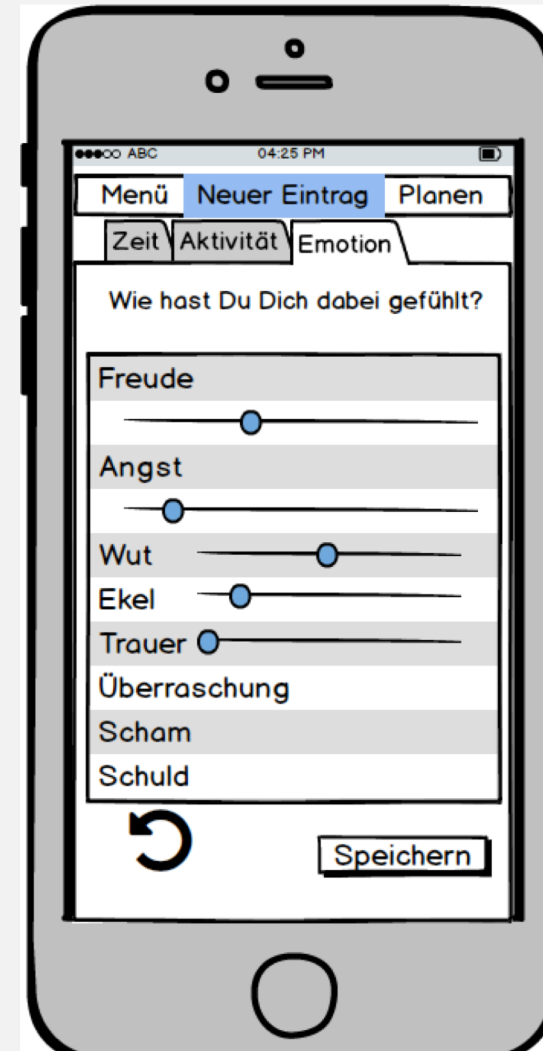
Low motivation/compliance, i.e. low usability.



## Design Iterations



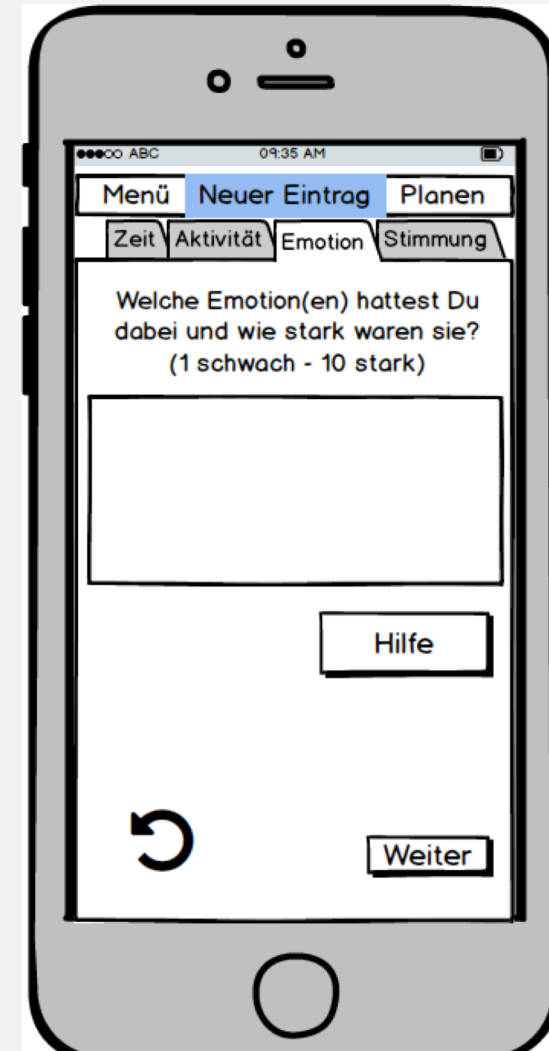
1<sup>st</sup> Iteration



2<sup>nd</sup> Iteration

#### formative evaluation with therapist:

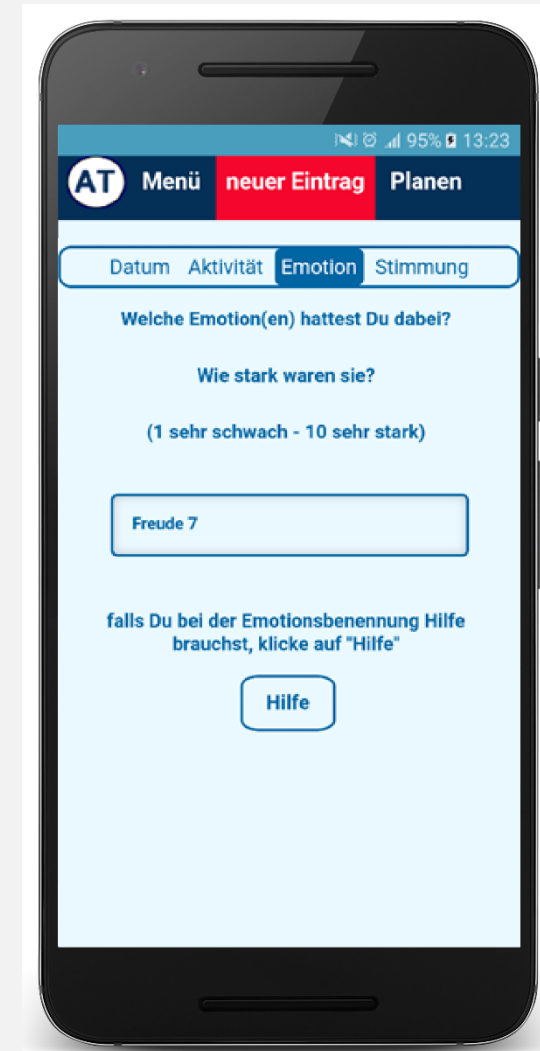
- suggestions for different phrasings,
- emotions and intensity should be written down,
- emotions and mood should be logged



3<sup>rd</sup> Iteration

#### formative evaluation with patients:

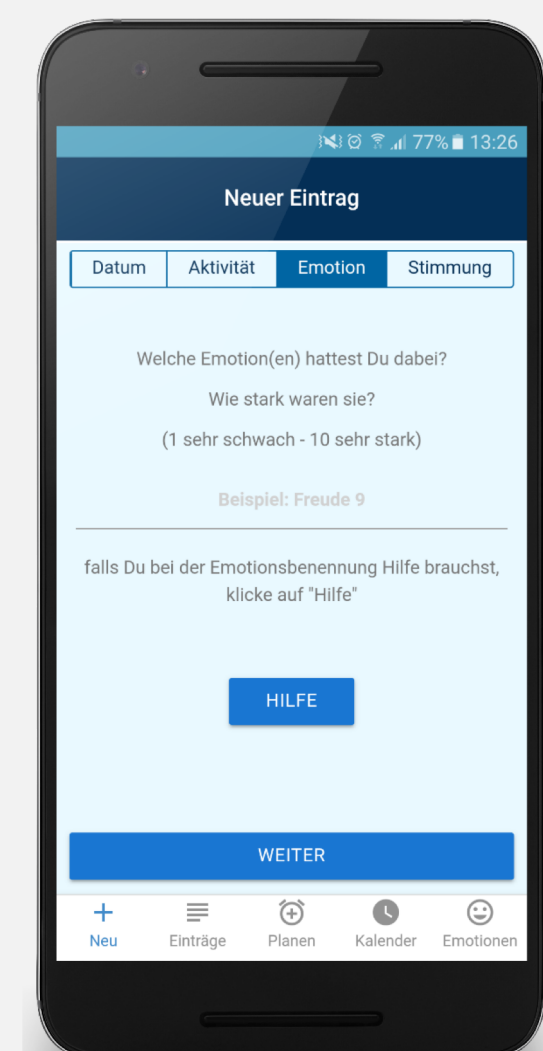
- appreciated the idea of the app,
- app was seen as easier to use than the paper version



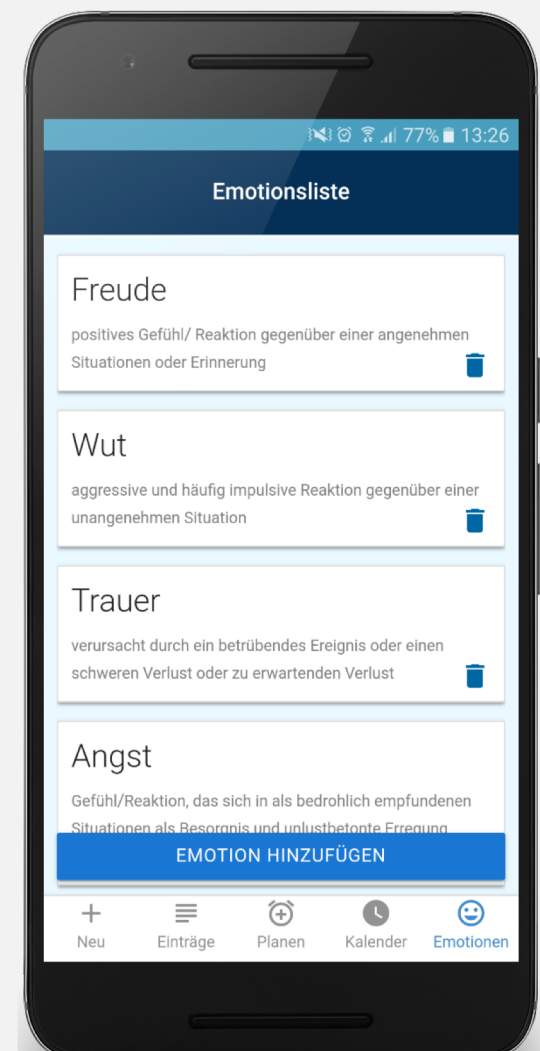
4<sup>th</sup> Iteration

#### evaluation with patients:

- positive impression
- understood the app and used it even after the evaluation was finished
- (Therapists confirmed more entries were made with the app than on paper.)



5<sup>th</sup> Iteration



6<sup>th</sup> Iteration

- One screen for logging and planning and scrolling.
- Select emotions from a list.

- Separate screens for logging and planning.
- Focus on “what” not “when”.
- Log emotions or mood.

- Text field for emotions.
- List of basic emotions as support.
- Mood selection via smileys.

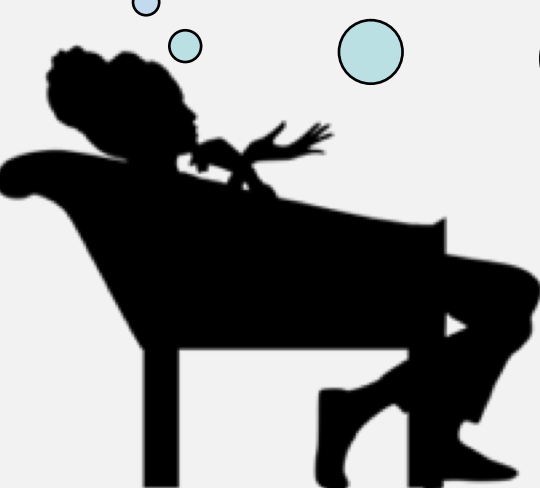
- Implementation with Cordova and SQLite DB for data storage.
- Sharing stored entries via email (can be imported in Excel).

- Added iOS version.
- Reminder function.
- Time-stamps.
- Name: “**Dacemo**”
- Duration of an activity.
- Multiple emotions can be logged.

- Improved reminders.
- Time intervals.
- Export changed to JSON.
- Developed an app for therapists.

## Discussion of the Development Process

Patient Perspective



I want to effortlessly select the emotion from a list by clicking on it.

I need an edit function in case I make a mistake when entering data.

Patient have to reflect on their emotions, so they must write down their emotions manually.

Patients might be influenced by their depressed mood and later change their correctly logged emotions.

Therapist Perspective



## Conclusion

- Activity diary for people with depression was developed.
- App was well received by the patients.
- Patients continued to use it even after the evaluation was finished.
- Different requirements of patients and therapists show the need for a human-centered development.
- More effort must be invested in finding solutions that satisfy both perspectives.

Future developments/work of the mobile app could include:

- Dual-perspective solutions: Mindfulness-inspired entry combined with version history.
- Selective export of entries.
- Capturing of photos and audio.
- Data entry via smartwatch.
- Localization in different languages.
- Archiving of past entries.
- Extensive evaluation/RCT.

### References

- [1] Laura Andrade, Jorge J. Caraveo-Anduaga, Patricia Berglund, Rob V. Bijl, Ron de Graaf, Wilma Vollebergh, Eva Dragomirecka, Robert Kohn, Martin Keller, Ronald C. Kessler, Norito Kawakami, Cengiz Kilic, David Offord, T. Bedirhan Ustun, and Hans-Ulrich Wittchen. 2003. The epidemiology of major depressive episodes: results from the International Consortium of Psychiatric Epidemiology (ICPE) Surveys. International Journal of Methods in Psychiatric Research 12, 1 (2003), 3–21.
- [2] Katja Beesdo-Baum and Hans-Ulrich Wittchen. 2011. Depressive Störungen: Major Depression and Dysthymie. In Klinische Psychologie & Psychotherapie (2nd ed.), Hans-Ulrich Wittchen and Jürgen Hoyer (Eds.). Springer, Berlin, Germany, 879–914.
- [3] Hans-Jürgen Möller, Gerd Laux, and Arno Deister. 2013. Psychiatrie, Psychosomatik und Psychotherapie. Thieme, Stuttgart, Germany.
- [4] Hans-Ulrich Wittchen and Frank Jacobi. 2006. Epidemiologie. In Volkskrankheit Depression? Bestandsaufnahme und Perspektiven, Gabriela Stoppe, Anke Bramesfeld, and Friedrich-Wilhelm Schwartz (Eds.). Springer-Verlag, Berlin, Germany, 15–37.

### More information at



### Authors at the Conference



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