Development of a self-help CBT-based digital intervention for functional cognitive disorder (Mementum App)

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Introduction

Functional cognitive disorder (FCD) accounts for around a quarter of patients seen in specialised memory clinics.

It is **disabling** and often does not remit without treatment.

Two treatment meta-analyses identified **limited** randomised controlled trials (RCTs) and efficacious **treatment options for subjective cognitive symptoms**, a proxy of FCD, and no published RCTs specifically for FCD.

Pilot data and clinical experience suggest that **education programmes and psychotherapy** targeting intuitive but counterproductive memory beliefs **are potentially beneficial**.

Of the approximately **350,000 healthcare apps** available for download, **few are evidence-based** or endorsed by public health organizations such as the National Health Service (NHS).

Aim

This study describes the **planning and development stages** of a new self-help mobile app intervention for FCD.

This is the first of several ongoing studies including a feasibility evaluation which will be a proof of concept prior to a future RCT.

Methods

A combination of a theory- and user-centered approaches was adopted.

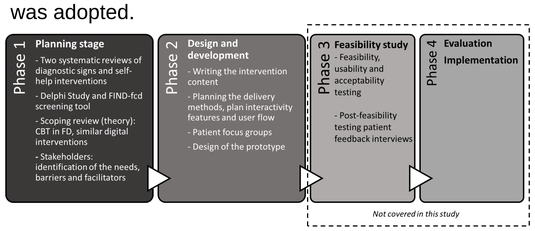


Figure 1. *Intervention development process according to MRC stages.*

The technical platform and the contents of the intervention were developed *de novo*. The technical platform was developed by VC in collaboration with a no-code platform Cogniss®.

Results

1) Scoping review: remote delivery of CBT in Functional disorders

Self-management approaches through CBT-based guided self-help, including workbooks and telemedicine, have shown **good patient adherence and satisfaction**, with reasonable benefits for reduction of distress and disability.

Internet-based self-help approaches (iCBT) have become increasingly important to supplement standard care.

In neurological patients, iCBT was tested for depression in epilepsy and fatigue in multiple sclerosis, with **small to large effect sizes** across different pathologies, including in patients with comorbid cognitive difficulties.

Although results are mixed, **iCBT may be as effective as face-to-face CBT**, and superior to waitlist control groups, offering greater accessibility and cost savings.

Mobile app-based CBT (mCBT) may be at least as effective as iCBT for conditions similar to FCD such as pain, 'post-concussion syndrome' and health anxiety.

Smartphones is being more **portable** than a computer, and allowing transfer of therapeutic strategies to daily context, which is relevant for FCD.

Both human and automated forms of support have proven effective, **acceptable** and associated with patient satisfaction.

Importantly, evidence suggests that **therapeutic alliance** can be sustained even in unguided internet interventions.

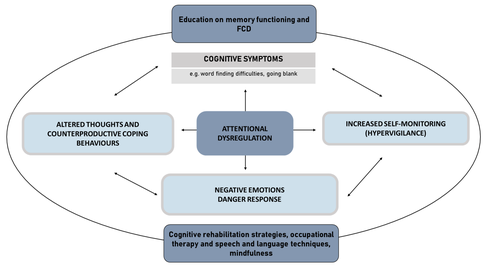
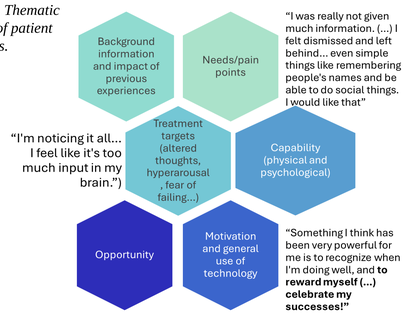


Figure 2. *Proposed treatment model including an education element, CBT-based therapeutic techniques, speech and language and occupational therapy techniques incorporated as part of brief cognitive rehabilitation content, and mindfulness. The model highlights several maintaining factors that are potentially modifiable, and the role of excessive attention being diverted to this loop, instead of normal tasks.*

Results

2) Identification of user needs

Figure 3. *Thematic analysis of patient interviews.*



3) Focus group (identification of barriers/facilitators)

Intervention characteristic	Facilitators	Barriers
Engagement	▪ Credible and useful information ▪ Possibility of saving favourite content ▪ Free ▪ Portable	▪ Learning saturation point ▪ Screen time and overstimulation ▪ Minimum of digital literacy ▪ Competing with work and other life commitments
Symptom monitoring (e.g. memory diary, symptom check-in)	▪ Ability to review progress ▪ Follow the course of the programme	▪ Drawing attention to the symptoms can exacerbate self-monitoring
Information	▪ Tecnhiques to apply in daily life with practical examples ▪ Accessible with various formats: video, text, audio	▪ Not knowing what information is being the most helpful ▪ "Non-adjustable" information
Patient stories	▪ Learning from others' experiences ▪ Validation of symptoms	▪ Stories gathered not resonating with the patients or their situation
Video guided-exercises	▪ Having everything in one place ▪ Having clear instructions on how to do the exercises ▪ Secondary benefits for stress management	▪ Not enough prompts to engage with these resources ▪ Poor concentration ▪ Difficulty following instructions

Table 1*. Examples of barriers and facilitators identified by the users.*

4) Treatment content

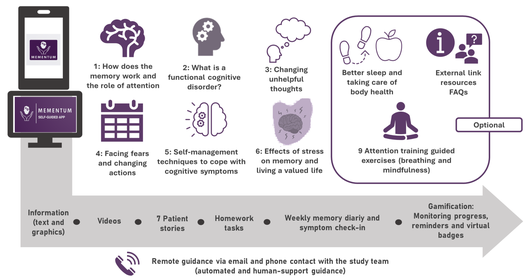
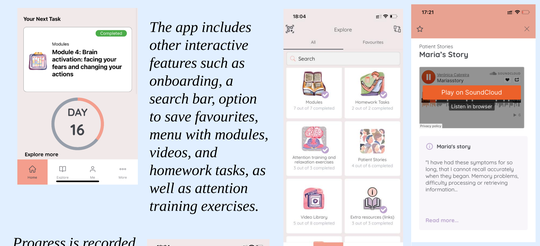


Figure 4. *Overview of treatment content (Mementum website and mobile app). Patients will receive telephone calls bi-weekly and weekly emails.*

Results

5) Design of the technical platform



The app includes other interactive features such as onboarding, a search bar, option to save favourites, menu with modules, videos, and homework tasks, as well as attention training exercises.

Progress is recorded in users "My results" section, as well as a day counter and "virtual badges" for module completion.

Social support is supplemented by the use of real patient stories.

Information will be tailored using answers introduced in a symptom checklist.

A weekly memory diary promotes self-reflection and symptom management.

Different information formats (text, graphics, audio and video) were chosen to increase accessibility.

Users can also interact with FAQs and external links with extra resources.

Conclusions

We used a systematic approach to plan and develop a novel digital health intervention for FCD.

There is a major need for evidence-based interventions for FCD that can bridge the treatment-demand gap and offer early post-diagnostic support.

The intervention is designed to be made available at no cost within the NHS environment for patients with a formal diagnosis.

Feasibility, acceptability, and efficacy will be tested in future studies which will provide pilot data for a full-scale RCT.

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