

Persuasive Co-Design of Self-Control Intervention App (SCIPP) for People with Severe Mental Illness

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1. Introduction

People with severe mental illness (SMI) are at risk of early mortality [1] due to life-style-related factors such as smoking [2], sedentary behaviour [3], and limited physical activity [4]. Digital interventions may be feasible for improving the lifestyle of people with SMI [5]. However, these are rarely designed with attention to persuasive design or preferences of people with SMI and in turn show low adherence and high drop-out rates [5]. This study describes persuasive features of a digital intervention aimed at improving physical activity through self-control training (SCT) as elicited through co-design. In SCT, participants perform simple tasks that require self-control (e.g. using the nondominant hand) to practice overriding an impulse and replacing it with a preferred response [6]. The role of self-control in enabling healthy behaviour [7] and SCT effectiveness [8] is well-established and may suit people with SMI, as it does not rely on language or cognitive skills.

2. Methods

The co-design study involved 4 patients and 2 care providers with lived experience (50% women) recruited via convenience sampling through two Dutch care facilities.

The study consisted of 3 workshops aimed at identifying the needs and preferences of people with SMI around digital SCT. Prior to the workshops, participants received a booklet with exercises [9] to create awareness of when and how they use self-control in their daily life. The first workshop elicited participants' experiences with- and attitudes towards self-control through 2D-collaging and a moderated group discussion. During the second workshop, mock-ups of app elements were discussed (e.g., ways to monitor progress). After this workshop, a design-company developed three paper prototypes based on participants' input and design artefacts. In the final workshop, participants explored and critiqued these prototypes' appeal and perceived usability. All workshops were audio-recorded, transcribed verbatim and pseudonymized. Data was used in a reflective thematic analysis [10]. Our approach was both inductive and deductive: comments of participants directly informed codes, while resulting themes were mapped to persuasive features from the Persuasive Systems Design Model [11].

3. Findings and Discussion

Self-monitoring, Reduction, Social Role, Praise, Personalization, Real-world feel, and Liking were identified as persuasive features to engage people with SMI in SCT.

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Self-control was seen as a gradual process of trial and error: *"like, I can't do it un-til... I do it, I do it, I try again. The risk is that you can see, 'oh I did well [on that day]' but then 'not at all'. Well yeah. But someone can see very clearly what they have accomplished. And it's a winding road, don't you think? That's it. I do it with trial and error."*

- Ava. Participants wanted to monitor the progress of SCT, while allowing more than a simple forward trajectory. This was operationalized as a visual overview featuring a winding mountain path, in which failed challenges were included without penalty.

Social support was seen as vital in behavior change by both patients and care providers. Jackson explained that: *"there should always be a button on the app stating, 'I'm stuck' or 'I can't do it alone', and you should get a message, receive a notification 'hey [name] doesn't get it' or 'he cannot walk alone today, he wants to walk with someone'.* Collaboration was characterized by praise, which participants also wanted to see in the app: *"You also, eventually everyone, needs some encouragement or a compliment when they have done something right. That is how I see it, you do it alone, you really do it alone, but you need others."* - Ava. Both features were operationalized as a cartoon character guiding the user through SCT with compliments and collaborative language.

Participants mentioned that the app should be related to daily life. This was reflected in the need to include real, tangible goals: *"you should actually start right in the beginning with an assignment that has to do with the end goal, of, of, walking"* - Jackson. Goals were diverse, and included healthy eating, physical activity, smoking, emotion regulation, and others. In the app, users can therefore personalize their own health goal.

Finally, in terms of Liking, Ethan shared that he is easily overstimulated by de-tails, and preferred a minimal design. Visualizations were also preferred over numerical or textual information, which were considered confusing, and unnecessary: *"again, I just really don't think numbers are ideal for, uh, keeping track of things, because I'm, again, sure that people with psychiatric conditions, for example, [they] just don't want, uh, math and numbers. They just want, for example, as we have here, that you work with progress with squares, with colors."* - Jackson. This feature was incorporated in the app's design through flat, neutral visualizations and a minimal two-color palette.

4. Findings and Discussion

This study has identified seven persuasive features relevant to people with SMI. Social support is a known facilitator of health behaviour [12], while reduction is included in recent design guidelines catered to people with SMI [13]. Yet features such as praise provide novel insight in people with SMI's preferences. The study has also shown that involving people with SMI in persuasive design is feasible, which may improve implementation [14]. Future research should explore the generalizability of these persuasive features to other lifestyle interventions targeted towards people with SMI.

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