

# SERO Suicide Prevention App: A Preliminary Study of User Experiences in Real World

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## Abstract

The study's objective is to explore users' experiences with the SERO app, a suicide prevention app. Its main functionalities include a self-assessment tool, safety plan, information and contact numbers that can be personalized. To collect the experiences, all registered users were contacted by E-mail and asked to fill a questionnaire with 3 open-ended questions and 2 questions with predefined answers. 74 persons answered the questionnaire. Generally, they confirmed that the app is easy to use and particularly the safety plan and self-assessment tool were very much appreciated. The responses were valuable to learn about the challenges of users in benefiting from the app usage, which is providing sufficient guidance for developing safety strategies.

**Keywords:** Usability; Suicide prevention; Testing; Digital health intervention

## Introduction

There has been a growing interest in using digital tools to provide timely and accessible support in self-management to individuals at risk of suicide [1]. Research has shown the effectiveness of these digital interventions, particularly in regions with limited access to healthcare [2]. However, user non-adherence remains a challenge, often leading to high dropout rates [3]. A valuable source of information are observation studies to collect feedback from users that use the solution in real world without controlled settings. The focus of this study is to explore the real-world user experience of the SERO app [4], a digital intervention designed specifically for suicide prevention.

The SERO app is designed to support 1) people with suicidal behavior and 2) their families. People with suicidal behavior can use the app for self-assessment using the PRISM-S method [5], help-seeking and safety planning. They can access their personal safety plan and share it with relatives. Relatives can access the safety plan of an at-risk person who has chosen to share this information with them. They receive self-reflection support from the app (resource plan), as well as information on how to support the person seeking help. When the reminder feature is enabled, the application sends items retrieved from the safety plan or resource plan as pop-up messages to the user's phone. Data collected by the app is stored on MIDATA, a data storage ecosystem. 1597 users are registered by March 9, 2024 with 123 registered as relative. By understanding perceptions of usefulness and challenges in interacting with the app from a user's perspective, we aim to inform future iterations of digital interventions and ultimately improve support for those at risk of suicide and their relatives.

## Materials and Methods

The link to the self-customized online survey was sent to all registered users on 5 February 2024. The consent management implemented in MIDATA allows to send emails to registered users while maintaining their anonymity. The survey was open to be filled for 4 weeks. We kept the questionnaire as short as possible and easy to answer. The survey contained 4 questions. None of them was mandatory: 1) In which role did you use the app? (4 options), 2) Which features of the app do you find useful? (open-ended question), 3) Which difficulties in usage do you have? (open-ended question), 4) Which suggestions for improvement do you have? (open-ended question). Additionally, we determined the Net Promoter Score (NPS) which is a customer loyalty metric that ranges from -100 to 100. NPS is calculated based on responses to the question: "On a scale of 0 to 10, how likely are you to recommend the SERO app to a friend or colleague?" Based on their scores, respondents are categorized into three groups: promoters, passives and detractors.

## Results

The survey was answered by 74 persons. They answered the 5 questions in average in 5:16 minutes. 62.2% (n=46) claimed of having used the app in the role of a person with suicidality; 21.6% (n=16) used it in the role of a "relative"; 5.4% (n=4) selected both options (individual with suicidality and relative). 10.8% (n=8) claimed they do not know in which role they used the app. The NPS was 28 resulting from 40 promoters, 15 passives and 19 detractors.

### *Useful Features*

We received 73 free text responses about the usefulness of the SERO app features. Some of these were explanations without any indication of useful features. The safety plan was mentioned most often as a useful feature with 37 mentions (50.7%). Self-assessment was the second most frequently mentioned feature (n=24, 32.9%). The availability of emergency numbers (n=6, 8.3%) and contact numbers for friends and family (n=2, 2.7%) in the app were less frequently mentioned. The resource plan was considered useful by 16 people (21.9%). Push notifications, information and sharing the safety plan were each mentioned by 1 participant (1.3%). 10 participants (13.7%) stated that everything in the app was useful. For example, one statement was "I think all areas are very important. Sometimes you lose track of things or you can no longer access your resources". (translated from German). 3 people (4.1%) stated that they had not used the app but had recommended it to health professionals (n=1) or patients (n=2, 2.7%). 1 person (1.3%) stated that he/she had been recommended the app but had not yet used it.

### *Difficulties in Interacting with the SERO App*

Most of the 65 participants who answered the question about difficulties confirmed that they had not experienced any difficulties (n=41, 63%). 2 people (3%) complained about having to log in repeatedly to the app. Sharing the safety plan was difficult for 3 people (4.6%). Changing the order of contacts, adding new contacts, completing the self-assessment and logging out to change roles were each reported by 1 person (1.5%). Difficulties in filling in the safety plan were mentioned by 2 people (3%). Some participants reported challenges with the structure of the tools, i.e. in formulating the items to be included in the safety plan and answering the follow-up questions associated with each self-assessment (PRISM-S). Feedback suggests that the questions related to the reflections on the positioning of the intervertebral discs are difficult to answer. One comment was "When assessing the risk (prism method), the follow-up questions are very similar and difficult to answer.". Regarding the safety plan, participants found it difficult to formulate helpful beliefs; the differences between "distraction strategies" and "coping strategies" to be added by the user were not obvious.

### *Possibilities for Improvement*

Possible improvements or confirmations of satisfaction are provided by 49 participants and include adding a dedicated pastoral care number alongside the existing emergency contacts. A clear overview of functionalities should be available on the starting screen of the app. The safety plan could be better structured, e.g. by allowing

users to place resources or motivational elements around an avatar representing themselves, potentially helping to motivate them to persevere. Highlighting the key elements of the safety plan would make navigation easier. To increase accessibility, suggestions were made for offline use and access without registration, allowing users to look up information provided by the app without restrictions. More comprehensive information on coping strategies and skills, including suggestions for dealing with self-harm or extreme stress, coping with difficult emotions and situations, crisis management exercises and push notifications to check for early warning signs were requested. One participant suggested the inclusion of a diary feature to track and evaluate their day, to monitor anxiety, stress, health and sleep patterns.

## **Discussion**

From our study, we can confirm that the safety plan and self-assessment are perceived useful features of a suicide prevention app, even when it is used without being embedded in a therapeutic context. The reported interaction challenges are rather related to the self-management capabilities of an individual at risk. We assume that the reflection on the self-assessment could become easier when it has been practiced together with a therapist several times before using the app. In future work, we will find out how to improve the app to support in this more appropriately. Based on the detailed feedback and experiences shared by the participants of our survey, several suggestions for future iterations of digital interventions for suicide prevention can be derived. Users should be able to access some of the application's resources and features offline, ensuring that support is available without an internet connection. The SERO app provides already some information offline, but users have to be logged in which requires an internet connection if not done before. To lower the barrier for first-time or occasional users seeking immediate support, certain features should be even accessible without the need to register.

Our study comes along with some limitations. 74 out of 1597 registered users participated in the survey which cannot be considered to be representative, and generalizations are impossible. However, it was not our intention to get a representative sample, but to get impressions from users for improving the app. In contrast to other papers who report on usability tests with their users conducted in controlled settings as part of clinical trials, our survey provides feedback from individuals that really used the app in real world. We expect that the collected feedback is more valuable than feedback collected in controlled settings with selected participants. We do not know whether the participants are aware of all features available in the app (e.g. sharing, push notifications). It remains an open issue whether this digital tool can support in acute crisis situations.

## **Conclusions**

In conclusion, the perceived usefulness of the SERO app, specifically the safety plan and self-assessment tool was evidenced by the positive perception. The study underscores the need of establishing an ongoing user feedback mechanism to facilitate continuous app refinement and ensure alignment with the dynamic landscape of user requirements and real-world application. Although regulatory constraints preclude the integration of certain enhancements suggested by the participants, the recommendations to enhance the utility of the app underscore the potential to increase user engagement and personalization in the app.

**List of Abbreviations:** PRISM-S – Pictorial Representation of Illness Self Measure – Suicide, NPS – Net Promotor Score.

**Author Contributions:** KD defined the research's aim and the experiment's design; carried out the experiments and analyzed the data. FVK, CG, MD interpreted the results. All authors contributed to the discussion. KD coordinated and MD helped to draft the manuscript. All authors read and approved the final manuscript.

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