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User-Centered Design of Mica, a Mental Health App Supporting Students in Higher Education

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Abstract. Mental health challenges disproportionately affect Swiss university students, driven by academic, financial, and personal stressors. This study presents *mica*, a mental health app tailored to students, developed through a user-centered design approach. Insights from a survey of 102 students, expert interviews, and usability testing informed the app's key features: access to local mental health resources, a self-assessment tool, organizational aid, and multimedia content. The non-functional prototype incorporates 13 functional and 3 non-functional requirements, refined through iterative testing. Unlike existing solutions, *mica* integrates regional counseling services with a student-focused design. While promising, the study's limitations include sample bias and a short survey period. Future work will validate findings through broader surveys and explore advanced features like conversational agents. *Mica* aspires to destigmatize mental health and offer accessible support to Swiss students.

Keywords. Mental health, student health, mobile app, user-centered design

1. Introduction

A 2022 report by the Swiss Health Observatory revealed that 35 % of the Swiss population faced mental health issues within the last year, with common concerns including eating disorders (13 %), depression (12 %), and anxiety (9 %). Worryingly, feelings of loneliness have surged, particularly among young adults aged 15 to 24, affecting 32 % of young women and 22 % of young men [1]. Similar results have been shown by the EUROSTUDENT project, collating student survey data among 25 European countries [2].

For university students, the situation appears even more concerning. According to the Federal Statistical Office, 23 % of Swiss students report moderate to severe depressive symptoms, with higher rates among women (27 %) compared to men (18 %). Younger students, particularly those under 20, show the highest incidence of depression, nearly double the rate of the general population [3]. Students face unique stressors, from adjusting to independent learning and balancing work with studies, to navigating identity

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and self-worth challenges. These factors, along with exam stress, financial pressures, and uncertainties about the future, make them a particularly vulnerable group. Furthermore, a resolution by the Swiss student union argues that only 11 % of students think that they would make use of existing services for mental health, even if they needed them [4].

In today's digital world, mental health support has expanded to include smartphone apps, which offer accessible resources to bridge gaps in traditional care. Research has shown that digital mental health applications, such as those using cognitive behavioral therapy chatbots, can positively impact symptoms of depression and anxiety [5,6]. Given this context, this paper presents the user-centered design of mica ("mindful campus"), a mental health app specifically tailored for university students.

2. Methods

For the design of mica, we followed a user-centered design approach and combined an anonymized, student-oriented online survey and interviews with experts and students in the requirements engineering process [7]. The online survey aimed at discovering the needs of students regarding their mental health, their ideas and wishes towards a mobile mental health application. Students were also asked if they had already used any mental health support and/or mental health applications as well as additional demographic data, including gender, age, department, program and current semester). The survey was shared by directly approaching students as well as distribution of leaflets at Bern University of Applied Sciences. It was filled in anonymously and participants did not receive any monetary compensation or incentive. Focus group expert interviews were conducted with representatives of the Universities of Bern Counselling Centre and the Swiss Student Union. Additionally, a written interview was conducted with two students facing mental health problems at that time.

Based on the methods mentioned above, personas, user stories and functional as well as non-functional requirements were derived sequentially. Next, a non-functional prototype of the application was developed. Three usability testing sessions were conducted during this development phase, with ten, five, and eight participants, respectively. The first and third session each comprised pre-defined tasks, were unmoderated, and conducted remotely with students using the web-based usability research platform Maze (https://maze.co). The second session comprised explorative interaction with the app on a mobile device by faculty staff and experts. All three sessions resulted in several identified potentials for improvements which were also implemented after the first two sessions.

3. Results

The student survey was accessible for ten days (dates) and was completed by 102 participants. Regarding demographic data, the majority of participants was female (72 %), between 18 and 24 years old (57 %), studied at a university of applied sciences (88 %), and enrolled in the undergraduate or graduate study program of social work (60 %). The four stressors exam situations, time pressure and stress, financial situation and worrying about the future were selected by >50 % of survey participants from a predefined list. When asked for their current general health status on a scale of 1 to 10, participants replied with a mean of 7.2. On the contrary, when asked for their current

mental health status, the mean amounted to 6.3. 47 % of all participants had already consulted professional help regarding mental health-related problems. Table 1 shows the participant ranking of eight pre-defined application features, ranked on a four-grade scale (not important, important, very important, I don't know).

Table 1. Results of the student survey: Requested features (n=102)

Feature	Regarded as important or very important, % of participants
Information regarding existing services	86 %
Self-assessment	86 %
Work organization	79 %
Podcasts	76 %
Testimonials	75 %
Diary	65 %
Exchange with others	62 %
Chatbot	35 %

The expert interviews resulted in requirements that need to be met by a mental health app, e.g., low-threshold access to existing services and the application of the WHO-5 wellbeing questionnaire for self-assessment [8]. The two interviews with students provided additional insights into daily challenges to be faced when suffering from mental health-related problems. Based on the obtained results from the survey and interviews, four main pillars of a mental health application supporting students were defined. It should:

- make information regarding existing services and resources better available,
- provide a tool for a self-assessment of one's own mental health,
- provide organizational support (exams, projects, tasks), and
- provide podcasts or testimonials regarding diverse mental health topics.

Table 2. Derived functional and non-functional requirements. Priority: low, middle, high.

ID	Description	Priority	Depending on
FR-01	Self-assessment (WHO-5)	High	-
FR-02	Display results of self-assessment as curve	Middle	FR-01, FR-13
FR-03	Receive a recommendation after self-assessment	High	FR-01
FR-04	Overview of entered exams and tasks	High	FR-06
FR-05	Structure exams and tasks into sub-tasks	Middle	FR-06
FR-06	Enter exams and tasks	High	-
FR-07	Reminders for exams and tasks	High	FR-06
FR-08	Get information for existing counselling services	High	
FR-09	Low-threshold contact to counselling services	Middle	FR-08
FR-10	Mental health podcasts and testimonials	Low	-
FR-11	Sign-up	Middle	-
FR-12	Sign-in for app personalization	Middle	FR-11
FR-13	Persist data	Middle	FR-12
NFR-01	Unified app design	High	-
NFR-02	Bright and appealing color scheme	High	-
NFR-03	Ensuring data security	High	-

Three personas and eleven user stories were defined to derive an initial set of 13 functional and three nonfunctional requirements, shown in Table 2. All requirements were implemented in the application prototype. See Figure 1 for three example screens from the prototype addressing all collected requirements and developed using Figma, a collaborative design tool (https://figma.com).

The first usability test session resulted in two potentials for improvement, including the clarification of hints during the sign-up process and refinement of the app navigation. After the second usability test session, seven additional potentials for improvement were identified, e.g., the simplification of error handling during sign-up/sign-in, the unification of fonts on the start screen, the refinement of the self-assessment screen. The need for further refinement of the app navigation was again identified. The third and last usability test session resulted in the determined need of an app onboarding and several minor improvements for the main features self-assessment, planner, information, and podcasts.

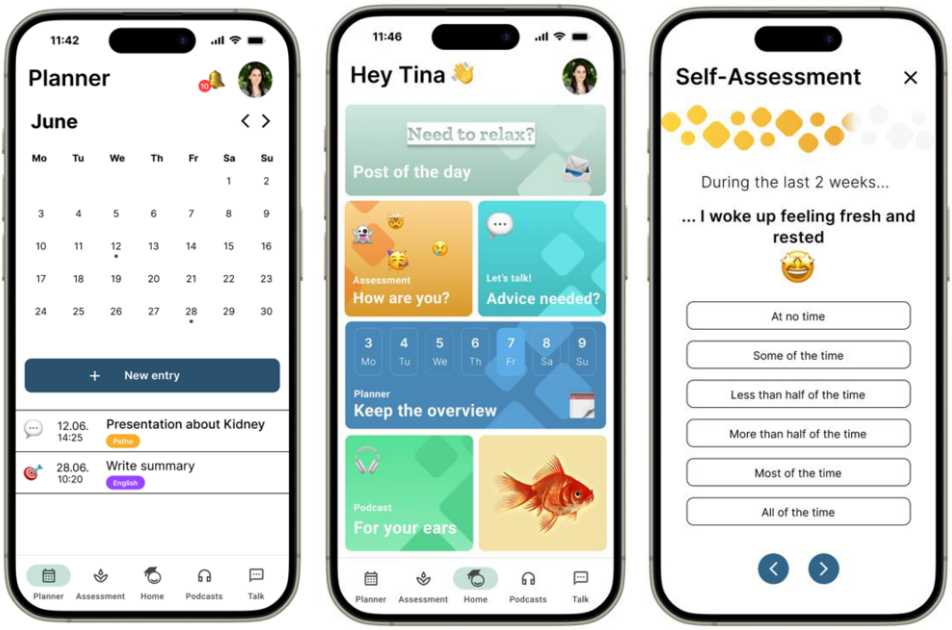

Figure 1. Three example screens from the app prototype, translated to English. Left: Planner. Middle: Home screen. Right: Self-assessment (WHO-5).

4. Discussion

With mica, we present the user-centered design of a prototype of a mental health application targeted at students. The app offers features for mental health self-assessment, organizational support, podcasts, and information regarding mental health and existing counseling services. In contrast to other existing mental health apps and commercial, general-purpose chatbots like ChatGPT (https://chatgpt.com), our prototype specifically

targets students and offers a regional focus, directly integrating local counseling and support services. Additionally, mica stands out with its modern design and appealing logo, contributing to user-friendliness. Mica currently does not provide therapy, as the app is supposed to connect students to existing counselling services and support them with daily challenges in study life. Including therapeutic elements might classify the app as a medical device as seen in Woebot, an evidence-based coaching app based on cognitive behavioral therapy [5]. A similar service is offered by the German start-up Minabot, which is currently in a closed-beta trial (https://www.minabot.ai/).

Future key challenges include integrating mica with university and learning management systems and ensuring long-term user engagement through, e.g., personalization and gamification. Data security remains a priority, with encryption, anonymization, and GDPR compliance protecting sensitive mental health information.

The following limitations apply: The survey results may lack generalizability due to the overrepresentation of female students (72 %) and social work students (60 %) at one institution. Additionally, the short survey period of ten days and the small, relatively homogenous participant groups in usability testing sessions may have limited the diversity of insights and feedback. These factors could restrict the broader applicability of the findings and the refinement of the app for a wider student audience.

5. Conclusions

Mica shows potential to facilitate easy access to information and provides a low-threshold gateway to essential resources, supporting destigmatization. The four main features of the prototype address the identified needs of students and experts. We currently implement a minimum viable product of the app based on the results reported in this paper to be tested with students within our institution. Open research directions include the integration of a conversational agent into the app and investigation of associated risks including user safety and trust. Furthermore, we intend to validate the identified requirements with a Swiss-wide survey. We envision our app to be available free of charge to all students in Switzerland in near future.

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