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Opportunities, Requirements, and Risks of a Student Mental Health Chatbot: A Qualitative User-Centered, Multi-Method Approach

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Abstract. Mental health challenges among university students are increasing, but stigma and limited access to professional support hinder help seeking. This study explored opportunities, requirements, and risks associated with developing a chatbot-based mental health application tailored to Swiss university students. Data were collected through semi-structured interviews with student counselors, administrators, and representatives, as well as a requirements engineering workshop involving key stakeholders. The results showed that a chatbot could reduce stigma, improve accessibility and support vulnerable groups, provided it included easy access, evidence-based content and emergency responses. However, concerns regarding data security, harmful advice, and over-reliance on the chatbot must be acknowledged. These findings highlight the need for ethical safeguards, robust design, and a complementary role for the chatbot within existing support systems to address student mental health effectively.

Keywords. Mental health, higher education, chatbot, mobile application, requirement engineering, user-centered design

1. Introduction

According to the World Health Organization (WHO), "Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community" [1]. Mental health has been increasingly challenged in recent years, particularly during and after the COVID-19 pandemic [2]. The pandemic brought about profound disruptions in social life, education, and work environments, triggering a 25% increase in prevalence of anxiety and depression worldwide [3], with young adults particularly affected. Students are especially vulnerable due to the unique stressors they face such as academic performance

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pressures, limited financial resources, and the growing necessity of part-time work to sustain their studies [4].

Several initiatives have been introduced in Switzerland to address the limited help seeking behavior specifically for students, including counseling services offered at study program, institutional, or regional levels, as well as launching awareness campaigns and provision of information flyers. However, a national survey conducted among students revealed that only half of those experiencing mental health challenges accessed existing services [5]. One key barrier identified is the pervasive stigma surrounding mental health issues, which deters students from seeking help [6].

Advancements in technology, particularly in the fields of large language models (LLMs) and conversational artificial intelligence (AI), present an opportunity to help address this issue. These technologies can provide an accessible platform to connect students with the mental health support, while also helping to reduce stigma associated with help seeking. Globally, digital mental health solutions have already shown first promises in reducing barriers to access and offering support [7]. Building on these advancements, we aim to develop a chatbot-based, mobile health application specifically designed for Swiss university students and outline its requirements collection process.

2. Methods

The identification of requirements was based on interviews complemented by a structured requirements engineering workshop elaborated in the following. Ten semi-structured qualitative interviews following a predefined, semi-structured protocol were conducted to gain insights into the perspectives of key stakeholders in the ecosystem of a Swiss University of Applied Sciences. These stakeholders comprised five student counselors, three representatives of student organizations, and two course directors. The interviews were conducted either remotely via Microsoft Teams or in-person. Online interviews were recorded and automatically transcribed. In-person interviews were recorded with a mobile phone and transcribed using the open-source software noScribe.

Analysis of the interview transcripts was performed by a single author (LA), based on thematic analysis aiming to identify, analyze, and interpret patterns and themes within the data [8]. An inductive approach was adopted, allowing themes to emerge directly from the data without being constrained by preconceived theories or frameworks. The analysis involved six steps: (1) familiarization with the data through repeated reading of transcripts, (2) generating initial codes to systematically organize meaningful data segments, (3) searching for themes by grouping related codes, (4) reviewing themes to ensure coherence and alignment with the data set, (5) defining and naming themes to clearly articulate their essence, and (6) producing the final report.

The 3-hour requirements engineering workshop was conducted with nine persons, comprising one course director, two senior researchers in the domain of eHealth and positive psychology, respectively, one expert (psychologist and psychotherapist), one student counselor, two students, and two student representatives. The workshop was designed to foster creativity and interactions among participants while reducing any primers that could influence the ideation process. Workshop activities included a free brainstorming session, the identification of potential risks and a world-café-based set-up to collect aspects regarding the three topics *Access*, *Design*, and *Interaction*. One author (DR) translated all outcomes into a standardized list of requirements phrased as user stories and a list of risks including their estimated impact severity and probability.

3. Results

The ten interviews were conducted between 06/09/2024 and 17/10/2024 and lasted between 26 and 43 minutes. We identified four main themes and fourteen sub themes from the interviews. An overview of all the themes can be found in Table 1.

Table 1. Table of themes from the interviews.

Main themes	Sub themes	Example codes
Perceived chances of a mental health chatbot within a university context	• Reducing students' reluctance to get help • Bridging between students' needs and existing resources	• Being able to open up when help is needed • Forwarding students to fitting services
Perceived risks of a mental health chatbot within a university context	• Recognizing critical cases • Anonymity and data security • Crowding out real social interactions	• Chatbot should recognize when professional help is needed • Anonymity as a prerequisite to use the chatbot • Creating dependencies
Most relevant topics and groups regarding mental health	• Learning and exam preparation • Balancing studies with other life areas • Personal challenges • First year students • International students	• Exams causing stress • Study-work balance • Identity challenges • First year as the biggest challenge • Home sickness
Accessibility and promotion of the mental health chatbot	• Thematic framing • Important communication partners • Places to advertise the chatbot • Events to advertise the chatbot	• Positive understanding of mental health • Student organizations • Campus-App • Introductory-Day

Based on the workshop results, 63 requirements were identified. In Table 2, we present six requirements deemed as high priority. The ten identified risks are shown in Table 3. We make the interview guideline, the final code system, and the complete lists of identified requirements and risks available online via OSF (https://doi.org/10.17605/OSF.IO/V4YGT).

Table 2. Subset of identified requirements with high priority.

Short title	Description
Forwarding to free services	As a student, I want to be forwarded to services that are free of charge.
Easy access	As a student, I want to easily access the chatbot (whenever, wherever).
Active approaching	As a student, I want to be offered help actively by the chatbot.
Collection of offers/events/help	As a student, I want to access an overview of (relevant) local offers, events and help.
Emergency situations	As a provider, I want the chatbot to detect if there is an emergency (e.g., suicidal thoughts) and offer the user addresses on where to go.
Evidence-based content	As a provider, I want the chatbot to be knowledgeable while being evidence-based.

4. Discussion

This research identified requirements, opportunities and challenges in implementing a university student mental health chatbot. Expert interviews highlighted its potential to reduce reluctance to seek help and connect students with resources, but raised concerns about identifying critical cases, ensuring anonymity and avoiding reduced social interaction. Key topics like exam preparation, balancing studies with life, and supporting vulnerable groups, such as first-year and international students, emphasize the need for tailored, context-aware design. Workshop findings prioritized requirements like easy access, active engagement, emergency support, and evidence-based content, while highlighting risks like misleading advice, legal issues, data breaches, parasocial relationships, and competition. These identified aspects highlight the need for the development of a dedicated system instead of using publicly available general-purpose chatbots (e.g., ChatGPT).

Table 3. Identified risks. I: Impact severity. P: Probability of occurrence. Scale: 1 to 5.

Short title	Description	Consequence	I	P
Misleading guidance	The chatbot provides wrong or even harmful advice.	User harm or death	5	2
Legal restrictions	Chatbot usage is prohibited due to legal restrictions (e.g., MDR).	The chatbot is not used.	4	3
Data breach	Chat histories containing sensitive and personal student data get leaked.	The chatbot 's image is negatively impacted.	4	3
Parasocial relationships	Users develop a parasocial relationship with the chatbot and experience negative consequences.	Users develop additional mental health problems.	4	3
Refusal of use	Users do not want to share their mental health-related aspects with a chatbot.	The chatbot is not used.	4	3
Competitors	Users prefer other tools (e.g., ChatGPT).	The chatbot is not used.	4	5
Trust issues	Users have trust issues towards the app and/or the provider regarding their personal data.	The chatbot is not used.	4	4
Missing publicity	Students do not know that the chatbot exists.	The chatbot is not used.	4	2
Insufficient funding	There is not funding to continue with the development of the chatbot.	The chatbot is not completed.	4	2
Unrelated use	Students use the chatbot for other things than their mental health (completing homework).	The chatbot is used in problematic ways.	3	5

4.1. Opportunities and requirements

One of the opportunities identified by participants was the chatbot's potential to reduce the stigma surrounding mental health issues. Stigma is a known significant barrier for students in accessing mental health services [9,10]. By offering a confidential and easily accessible platform, it may help build trust and adoption among its users, while facilitating earlier intervention and communication about mental health concerns. Additionally, the chatbot could serve as a bridge to connect students with appropriate mental health resources, as also suggested by previous research [11] or could promote interaction with peers [12].

Moreover, the chatbot could address specific challenges faced by university students, such as managing academic stress. Research has shown that mindfulness-based interventions, cognitive behavioral therapy, and technology-delivered interventions are effective in supporting the mental health of university students [13], highlighting the potential for the chatbot to incorporate evidence-based approaches to address these needs. By addressing these concerns, the chatbot has the potential to provide targeted support to all students, and specially to most vulnerable ones, such as first-year students and international students, who often face unique challenges in adapting to their environment, with research highlighting issues such as poor mental health, linguistic and cultural barriers, acculturative stress, and limited health literacy [9,14].

To maximize the opportunities that a mental health chatbot could offer students, several key requirements for its design and functionality were identified. Workshop participants agreed that the chatbot must facilitate easy access and actively engage students, ensuring that it is user-friendly and responds to their needs. Providing evidence-based content was another high-priority requirement identified in the workshop. In this regard, interventions based on mindfulness (e.g., for stress reduction) and cognitive behavioral therapy (e.g., to reduce symptoms of depression and generalized anxiety disorder) should be particularly considered [13].

In the workshop, it was also highlighted that the chatbot should include mechanisms for forwarding users to free mental health services and resources. In fact, the literature has reported that financial stressors are a relevant factor affecting mental health [15], and recommending free mental health services might help relieve these financial constraints. Another requirement was the chatbot's ability to handle emergency situations responsibly, including recognizing critical cases and therefore allowing early professional interventions. The need of providing crisis support through digital mental health interventions has been previously recommended in scientific research [16], suggesting

that the digital tool should have an ability to notify a designated health professional, in addition to providing information about helplines and self-care tools [16]. To ensure the chatbot effectively addresses students' needs, it is crucial to prioritize these requirements in its development and implementation.

4.2. Risks of a mental health chatbot for university students

The concerns from the interviews and workshops align with broader challenges in AI-based mental health tools, particularly regarding anonymity and data security risks such as data breaches. Despite limited research on these issues [17], they are critical for building user trust and promoting adoption of digital health technologies [18]. Participants raised concerns about chatbots providing harmful advice or failing to recognize crises, consistent with a recent study showing that many chatbots lack effective crisis response [16]. This highlights the need for robust emergency protocols [19], and emphasizes that chatbots should complement, not replace, human interaction [16]. Future implementations must balance technology use with encouraging interpersonal connections, particularly in the university setting where social support is critical for well-being. Additional expressed concerns included the potential risks of legal restrictions arising, competitors, lack of funding to maintain the chatbot, and even the possibility of a parasocial relationship between users and the chatbot. The findings from this study reinforce previous publications on the need for regulations [20] and human oversight [21] to mitigate risks and ensure the safety of the chatbot [22,23] in addition to focus mostly on efficacy.

4.3. Strengths and limitations

A strength of this research is its mixed-methods approach, which combines interviews and a workshop to gather diverse perspectives. This approach ensures a comprehensive understanding of the stakeholders' needs and insights, which is key for designing a user-centered mental health chatbot. The use of thematic analysis further strengthens the research by allowing for a detailed and inductive exploration of the data, ensuring that themes emerge organically from the participants' experiences. However, only a single author has carried out the analysis of interview data, which may have introduced potential biases. Additionally, the sample sizes are relatively small, which could limit the generalizability of the findings to other university settings or to other cultural contexts.

5. Conclusion

This study highlights the potential of a mental health chatbot to address the unique challenges faced by university students by reducing stigma, increasing accessibility, and connecting users with appropriate resources. Through a user-centered, multi-method approach, critical requirements such as easy access, evidence-based content, active engagement, and emergency support mechanisms were identified, alongside significant risks like data security concerns, the potential for harmful advice, and reduced interpersonal interactions. We conclude that a careful design is essential to mitigate possible risks already in the development phase by corresponding strategies. In future work, we will develop the chatbot considering the collected requirements and will test it with students.

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