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End Users' Perception on an AI Chatbot in a Snus Cessation Mobile Application

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Abstract. This study examines end-user perceptions of an AI chatbot as a virtual therapist through a design study of ExSnus, a prototype of a mobile health application designed to assist users in quitting snus. ExSnus includes features such as a forum to share experiences of the users' quitting journeys, and an AI chatbot that offers personalized advice and support. An interview study conducted after a usability test with university students revealed mixed opinions on the chatbot's role. While some participants valued its privacy and tailored interactions, others preferred the forum for its human connection. The findings also highlighted a preference for text over voice. These results show the challenges and opportunities of integrating AI chatbots in mental healthcare, highlighting the importance of considering users' opinions when implementing AI in therapeutic contexts.

Keywords. Snus cessation, addiction, mental health, mobile health application, conversational artificial intelligence, artificial intelligence chatbot, virtual therapist

1. Introduction

Lately, artificial intelligence (AI) is gaining popularity across all industries, including healthcare and, more concretely, mental healthcare [1]. One of the most widely used applications of AI is in the form of chatbots, which can communicate and guide individuals through different tasks [2]. In the case of mental health, AI chatbots can serve as virtual therapists by offering advice and acting as a line of support for people with mental health issues in a more affordable manner than traditional psychotherapy [3].

Numerous studies have shown that AI chatbots can effectively be employed to treat diverse mental health conditions, particularly for unserved populations [2]. For instance, XiaoNan, a chatbot built on the open-source conversational AI platform "RASA", was successfully used as a self-help tool for treating depression among Chinese university students [4]. Similarly, the chatbot Weabot has shown effectiveness in supporting individuals dealing with depression, anxiety, and substance abuse [5].

Along to the development of such technology, concerns related to the possibility of these chatbots replacing human therapists have emerged [6]. Nevertheless, these concerns rarely leave the academic world to consider the perspective of the end users who will be directly affected, that is, the opinions of people with mental health issues about mental health chatbots [7].

Snus is a moist oral tobacco product placed behind the upper lip where its active ingredients—primarily nicotine—are absorbed through the oral mucosa [8]. To tackle increasing snus use among Swedish youth, we designed a mobile health (mHealth)

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application to assist users in quitting snus. The research question of this paper is: How is an AI chatbot integrated into a mHealth application perceived by potential end users?

2. Methods

To answer the research question, we conducted a multiple case study (an interview study) after a usability test of a prototype of a snus cessation mHealth application called ExSnus was performed. A multiple case study supports us to get insights from several cases, thus helps us understand similarities and differences between these cases [9]. ExSnus integrates an AI chatbot function that aims to support people who want to quit snus. The chatbot provides advice on quitting snus, answers users' questions, and checks in on users through notifications, acting as an always present companion [10]. In addition to the AI chatbot, ExSnus includes other key features shown in Figure 1. Differently to other existing mobile applications that help with snus cessation, ExSnus provides social support to the users through two main functionalities: a forum where users can share experiences and an AI chatbot as their personal assistant during the quitting journey.

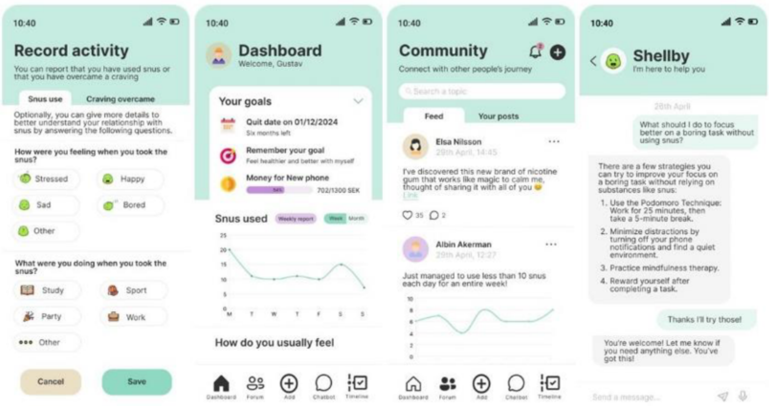

Figure 1. Examples of the designed prototype for ExSnus. From left to right, the screens for the tracking tool, dashboard, forum and AI chatbot [10]

Six university students in Sweden participated in the usability test and interview. Aged 23 to 28, most of them had prior experience using mHealth applications and AI chatbots. Before the session started, the participants were fully informed of the purpose of the session and how their responses would be anonymously included in the project report. This information was provided in a written consent form, which they signed to confirm their voluntary participation.

A moderated in-person approach was used for the usability test of this prototype. First, participants completed a questionnaire to collect demographic data relevant to the application being tested, which was considered during the analysis of results. A usability test was followed (described in [10]). A short interview was then conducted with each participant to answer two main questions about the application's functionalities: which part of the application they found most helpful for quitting snus and whether they felt more comfortable getting help from the forum or from the AI chatbot. The given answers were both written down and recorded, then transcribed for thematic analysis to identify similarities and differences in their responses. The participants' feedback informed the discussion on user perceptions on the AI chatbot as a virtual therapist.

3. Results

In response to the first question about their preferred functionalities of ExSnus to quit snus, participants highlighted the dashboard as the most valuable tool for tracking progress, as well as the educational content for better understanding the symptoms of quitting snus. Regarding the second question about their thoughts on receiving support from either other users or from the AI chatbot, opinions were not that unanimous. On the one hand, some participants preferred the forum because it allowed real interactions with other users experiencing similar challenges and where users could connect with friends. For instance, one of the participants stated, "I would like to see how my friends are doing so that it motivates me too". On the other hand, other participants felt uncomfortable sharing sensitive matters such as addiction to snus publicly, and thus preferred the privacy offered by the chatbot. One of the participants explained, "I won't ask in the forum something like 'How did you guys stop having this addiction anymore?' because I think it's very personal".

Focusing on the interaction with the chatbot, some users prefer text interactions while others found that a voice option would be easier to use and more accessible than typing. Those who rejected the voice option often did so claiming that they felt it was "weird" to talk to a machine. These preferences suggest that the perception of AI as a personal assistant plays a significant role in how users engage with the chatbot. Additionally, some participants suggested several personalization features for the chatbot to make interactions feel more engaging and relatable. Suggestions included naming the chatbot, choosing a profile image, or selecting a preferred tone of voice. However, other users found these personalization options not necessary. Finally, regarding the reminders provided by the chatbot, user opinions were similarly divided. Some participants appreciated the idea of automated reminders to keep them motivated through their quitting journey. However, others feared feeling overwhelmed through frequent notifications that would constantly remind them of snus when they were not using it, which would made them avoid the use of the application.

4. Discussion

The prototype of ExSnus incorporated an AI chatbot designed to support individuals during their process of quitting snus. Users can chat or talk with the chatbot about their worries or questions regarding snus, and in return, the chatbot gives personalized advice to each user. In this way, the AI chatbot is intended to support users with their needs, both addressing specific questions and broader emotional concerns, acting as an anytime available companion with which users can talk without fear of being judged or misunderstood. The described functionality shows the potential of this kind of technology replacing therapists plausible, especially interactive therapy services.

While professionals are largely debating the implications of such scenario, the perspective of the most affected group, the end users, is not usually being considered. Our study revealed that AI chatbots are not always positively perceived by the end users. Some participants preferred interactions with other users in the forum rather than chatting with the chatbot, citing the forum's realness and the opportunity to connect with friends. Some of these participants even rejected the idea of talking with the AI chatbot altogether, finding it weird or uncomfortable. Notably, these opinions came from young adults with higher education and technical expertise, a demographic usually more open to the use of AI in healthcare compared to older generations [11]. For example, in the US, 60% of older adults expressed that they would feel uncomfortable having AI recommending treatments, and three-quarters were concerned about AI adoption in healthcare being too fast without proper attention to patient security and privacy [12].

Other challenges in the interaction with the AI system as the care provider include the lack of collaboration from the patients for considering the AI chatbot too perfect and thus inhibiting personal disclosure due to fears that the machine can 'read' their minds [13]. Additionally, over-reliance on such technology to treat mental health might result in not seeing patients as individuals with unique needs anymore but commodities, so companies in the sector might eliminate the possibility of seeking human care due to economic incentives. This shift could result in the loss of personal connection and the neglect of individual needs. From a conversational perspective, AI chatbots are often considered useful for improving users' emotional state [14], but the perception that chatbots are friendly is more mixed [7]. Several studies [15,16,17] present contradictory preferences of users interacting with chatbots rather than human care providers, a dynamic that was also reflected in our study where some users preferred talking to real people while others preferred the privacy given by the chatbot.

Another significant advantage of AI chatbots is the companionship they offer. There are thousands of AI chatbots designed to act as therapists widely used online and their advantages listed by users include being able to talk from the comfort of their homes, quick instantaneous assistance, perpetual availability [18], and a fast therapeutic alliance between the chatbot and the patient [19]. Given that the social aspect plays a crucial role in managing addictive behaviours [10], AI chatbots can replace it in cases of individuals that cannot find support in their real lives, without the fear of being judged. This sentiment was echoed in our study, where participants valued the chatbot's non-judgmental nature and constant availability.

Our findings are limited by the small sample size and university students with high digital literacy as the target group, which may have biased perceptions of the chatbot. Further research should include more diverse user groups to generalize the findings.

These considerations raise critical questions: Is an AI chatbot a safer option for individuals who fear being judged for their addiction? Can it be as effective in the long term like human therapists, if the potential drawbacks in patient-chatbot relationships are resolved? Or should emotional aspects of care remain the domain of humans under the claim that AI chatbots lack intrinsic empathy and intuition of human care providers? [20]

5. Conclusion

The findings from our study reveal mixed user perceptions on AI chatbots as therapists for mental health. While some users valued the privacy and accessibility offered by the chatbot, others preferred human interactions and expressed discomfort when talking with it. As AI continues to integrate into our daily lives, the opinions among end users remain divided, with still limited trust in chatbot guidance in personal health. A key question remains: Will this perception shift as AI chatbots become more advanced and society grows more accustomed to their presence?

Future research should delve deeper into understanding how different demographics perceive and interact with AI chatbots in mental health settings. At the same time, studies should evaluate long-term efficacy of these chatbots in supporting emotional well-being.

References

[1] Espejo G, Reiner W, Wenzinger M. Exploring the role of artificial intelligence in mental healthcare: Progress, pitfalls, and promises. Cureus. 2023 Sep;15(9):e44748. doi:10.7759/cureus.44748
[2] Balcombe L. AI chatbots in digital mental health. Informatics. 2023 Oct;10(4):82. doi:10.3390/informatics10040082
[3] Fiske A, Henningsen P, Buyx A. Your robot therapist will see you now: Ethical implications of embodied artificial intelligence in psychiatry, psychology, and psychotherapy. J Med Internet Res. 2019 May;21(5): e13216. doi:10.2196/13216
[4] Liu H, Peng H, Song X, Xu C, Zhang M. Using AI chatbots to provide self-help depression interventions for university students: A randomized trial of effectiveness. Internet Interv. 2022 Jan;27:100495. doi:10.1016/j.invent.2022.100495
[5] Woebot Health. Woebot: Mental health chatbot. Woebot Health. Available from: https://woebothealth.com/
[6] Loewenthal D. Can AI replace not only therapists and romantic partners but the selves we once knew? Eur J Psychother Couns. 2024 May;26(1–2):1–13. doi:10.1080/13642537.2024.2314052
[7] Abd-Alrazaq AA, Alajlani M, Ali N, Denecke K, Bewick BM, Househ M. Perceptions and opinions of patients about mental health chatbots: Scoping review. J Med Internet Res. 2021 Jan;23(1):e17828. doi:10.2196/17828
[8] Byhamre ML, Araghi M, Alfredsson L, Bellocco R, Engström G, Eriksson M, Galanti MR, Jansson J-H, Lager A, Lundberg M, et al. Swedish snus use is associated with mortality: A pooled analysis of eight prospective studies. Int J Epidemiol. 2020 Dec;49(6):2041–2050. doi:10.1093/ije/dyaa197
[9] Baxter P, Jack S. Qualitative case study methodology: Study design and implementation for novice researchers. Qual Rep. 2008 13(4):544–559. doi:10.46743/2160-3715/2008.1573
[10] Puyuelo Citoler A. ExSnus: Designing a prototype of a social snus cessation mobile application with an integrated artificial intelligence function for university students in Sweden. Gothenburg, Sweden: Chalmers University of Technology; 2024. Available from: https://odr.chalmers.se/items/1da5f9de-ec77-41d4-b964-4537f77216d3.
[11] Noah B, Sethumadhavan A. Trust and acceptance of artificial intelligence in healthcare: Perspectives from users and developers. Proc Hum Factors Ergon Soc Annu Meet. 2019 Nov;63(1):2048–52. doi:10.1177/1071181319631029
[12] Tyson A, Pasquini G, Spencer A, Funk C. 60% of Americans would be uncomfortable with provider relying on AI in their own health care. Pew Research Center. 2023 Feb; Available from: https://www.pewresearch.org/science/2023/02/22/60-of-americans-would-be-uncomfortable-with-provider-relying-on-ai-in-their-own-health-care/
[13] Luxton DD. Recommendations for the ethical use and design of artificial intelligent care providers. Artif Intell Med. 2014 Sep;62(1):1-10. doi:10.1016/j.artmed.2014.06.004
[14] Inkster B, Sarda S, Subramanian V. An empathy-driven, conversational artificial intelligence agent (Wysa) for digital mental well-being: Real-world data evaluation mixed-methods study. J Med Internet Res. 2018 Nov;20(11):e12106. doi:10.2196/12106
[15] Razavi SZ, Ali MR, Smith TH, Schubert LK, Hoque M. The LISSA Virtual Human and ASD Teens: An Overview of Initial Experiments. In: Traum D, Swartout W, Khooshabeh P, Kopp S, Scherer S, and Leuski A, editors, Intelligent Virtual Agents. IVA 2016; 2016 September 20–23; San Francisco, CA, USA: Lecture Notes in Computer Science, Springer. doi:10.1007/978-3-319-47665-0_55
[16] Prendinger H, Lester J, Ishizuka M. Intelligent Virtual Agents. Proceedings of the 8th International Conference, IVA 2008; 2008 Sep 1-3; Tokyo, Japan: Springer Science & Business Media.
[17] Lisetti C, Amini R, Yasavur U, and Rishe N. I Can Help You Change! An Empathic Virtual Agent Delivers Behavior Change Health Interventions, ACM Trans Manage Inf Syst. 2013 Dec;4(4):1-28. doi:10.1145/2544103.
[18] Robb A. It's cheap, quick and available 24/7, but is a chatbot therapist really the right tool to tackle complex emotional needs? The Guardian. 2024 Mar 2; Available from: https://www.theguardian.com/lifeandstyle/2024/mar/02/can-ai-chatbot-therapists-do-better-than-the-real-thing
[19] Beatty C, Malik T, Meheli S, Sinha C. Evaluating the therapeutic alliance with a free-text CBT conversational agent (Wysa): A mixed-methods study. Front Digit Health. 2022 Apr;4:847991. doi:10.3389/fdgth.2022.847991
[20] Altamimi I, Altamimi A, Alhumimidi AS, Altamimi A, Temsah MH. Artificial intelligence (AI) chatbots in medicine: A supplement, not a substitute. Cureus. 2023 Jun;15(6):e40922. doi:10.7759/cureus.40922