Don't Lose Heart: Preliminary Engagement Results in an Ecological Momentary Assessment (EMA) Study Evaluating Digital Biomarkers for Asthma

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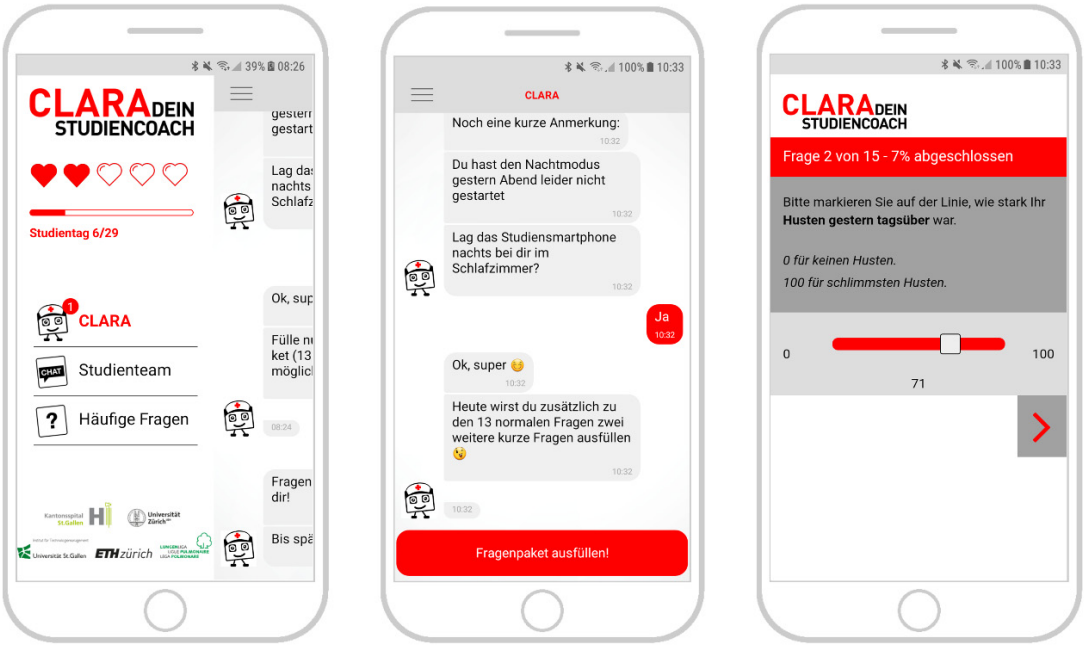
Preferred format of presentation (delete the option that does not apply):

Oral presentation

Context: In situ patient data over multiple weeks are needed to explore the potential of nocturnal cough and sleep quality as digital biomarkers for asthma. **Methods:** Ninety-four asthmatics need to complete a 29-day EMA study in which nocturnal smartphone sensor data is recorded and daily questionnaires of 13 to 45 items are delivered by an adapted version of the MobileCoach[1] app[2]. Patients are withdrawn from the study in case of non-adherence on more than five days. Adherence is not financially incentivized. Appointments with health professionals take place on the first and last day. **Intervention**: Engagement, operationalized as response rates to the questionnaires, is promoted using the following strategies: first, patients discuss with health professionals how they will integrate the study app tasks in their daily routine. Second, working alliance is established through the chat-based interaction with the app's virtual study nurse. Third, non-adherence is illustrated as lost hearts to elicit loss aversion. Finally, in case of non-adherence (on consecutive days) a notification system sends out reminder SMS to patients (prompts calls from health professionals). **Results:** The first 29 patients successfully completed 791 of the 810 daily questionnaires (97.65%). 58 reminder SMS were sent to patients and 13 calls by health professionals were triggered. One patient lost all hearts and was withdrawn from the study. The remaining patients completed the study with an average of 4.61/5 hearts (SD = 0.83). **Conclusion:** The preliminary results suggest that the employed strategies successfully promoted engagement in a population known for non-adherence in clinical practice[3].



References:

1. Filler, A., Kowatsch, T., Haug, S., Wahle, F., Staake, T., & Fleisch, E. (2015). *MobileCoach: A novel open source platform for the design of evidence-based, scalable and low-cost behavioral health interventions: Overview and preliminary evaluation in the public health context.* Paper presented at the Wireless Telecommunications Symposium (WTS), 2015.
2. Kowatsch, T., Volland, D., Shih, I., Rüegger, D., Künzler, F., Barata, F., . . . Heldt, K. (2017). *Design and Evaluation of a Mobile Chat App for the Open Source Behavioral Health Intervention Platform MobileCoach.* Paper presented at the International Conference on Design Science Research in Information Systems.
3. Pavord, I. D., Beasley, R., Agusti, A., Anderson, G. P., Bel, E., Brusselle, G., . . . Fahy, J. V. (2017). After asthma: redefining airways diseases. *The Lancet*.