

Novel m-health-tool to adequately discontinue short-term PPI treatment – results of pre-testing

Messner Kirstin¹, Rothen Jean-Pierre¹, Allemann Samuel S¹, Arnet Isabelle¹

¹Pharmaceutical Care Research Group, University of Basel, Switzerland

Introduction & Aim

- Proton pump inhibitors (PPIs) are among the most commonly prescribed medicines.
- PPIs are also one of the most frequently potentially inappropriate medicines (PIM) with around 30 % continuing treatments without indication.
- Unnecessary long-term treatments can cause adverse effects and increased healthcare costs.
- m-health represents a new opportunity to support patients while initiating, implementing and discontinuing short-term treatments.

We aimed at investigating the feasibility and usability of the m-health-tool mednet patient™ from openmedical patient AG (based in Switzerland) that assists patients during a short-term PPI treatment.

Methods

- Patients obtain **daily push notifications** that inquire three questions regarding PPI intake, symptoms, and disease burden in the past 24 hours (Fig. 1). All steps were developed with 2 GPs and 2 gastroenterologists.
- If a **pre-set threshold** is exceeded, an alarm is sent via E-mail to a pharmacist who calls the patient and can intervene.
- History is accessible via password-secured web application.
- Volunteers obtained **predefined scenarios** for 20 days of a mock PPI treatment to trigger an alarm after day 10 and no alarm after day 20, or vice versa.
- Volunteers kept a **diary** about the time they answered the push notifications, including space for free comments.
- After 20 days, volunteers filled out the **System Usability Scale (SUS)**³ and **User Experience Questionnaire (UEQ)**⁴. Higher scores indicate better value; experience is compared to benchmark data.
- Statistical analysis:** Specificity and sensitivity of the app were calculated by comparing electronic data and the diary. We calculated mean and standard deviation.

Fig. 1: Daily push notification with three questions

Results

- Eighteen volunteers** (age range: 21-84 years; 8 men, 10 women) participated between July and September 2022. Eleven could install and use the app, and three did not start.
- 152 out of 157 push notifications were confirmed that allowed to calculate a **specificity** of 96.8 % and **sensitivity** of 85.7 %.
- Based on the scenarios and after corrections for not following the given scenario (n=3), all **alarms** were triggered correctly (100%).
- SUS-score** indicated good usability, mean: 70.7 (+/- 13.3) out of 100; Fig. 2.
- UEQ-score** was lowest for “stimulation” and best for “perspicuity” (Fig. 3).
- Participants mentioned a low willingness to use the app again due to the complexity of the installation and registration process.

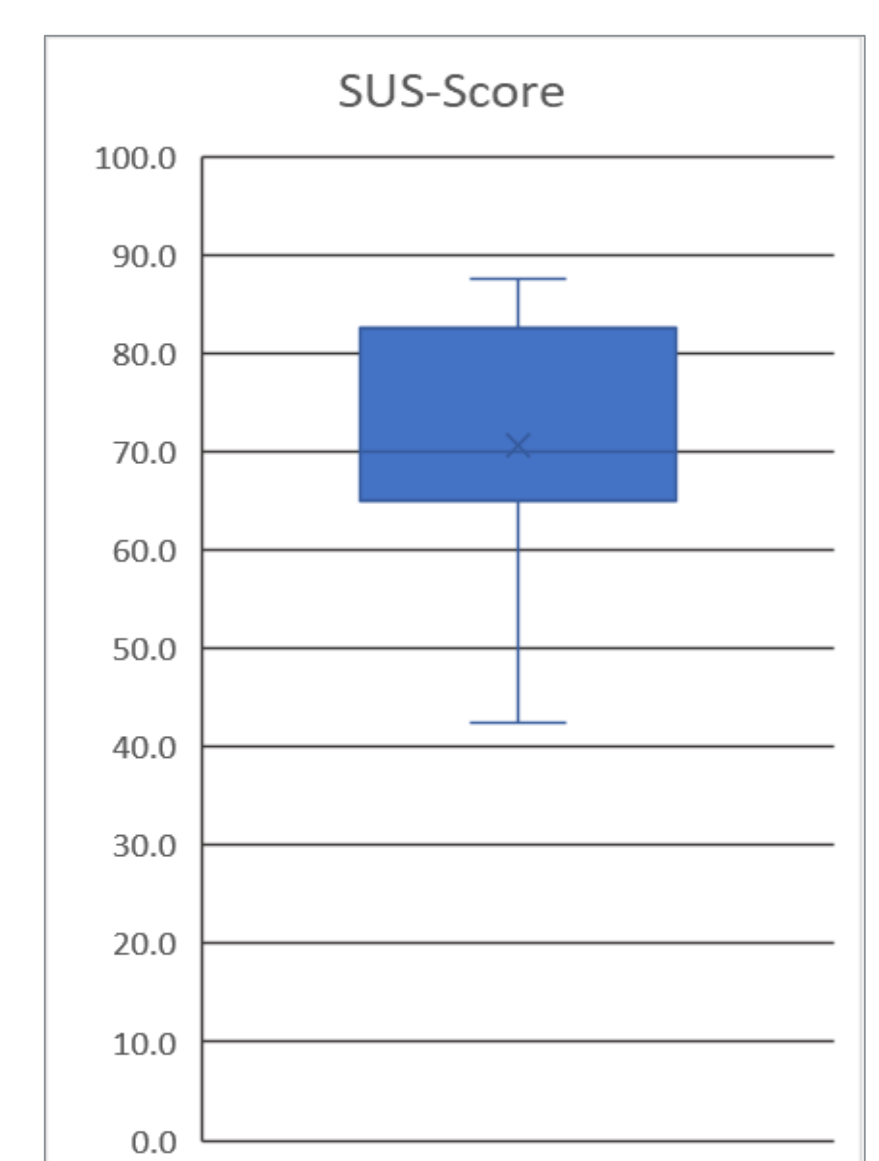


Fig. 2: SUS-Score of usability.

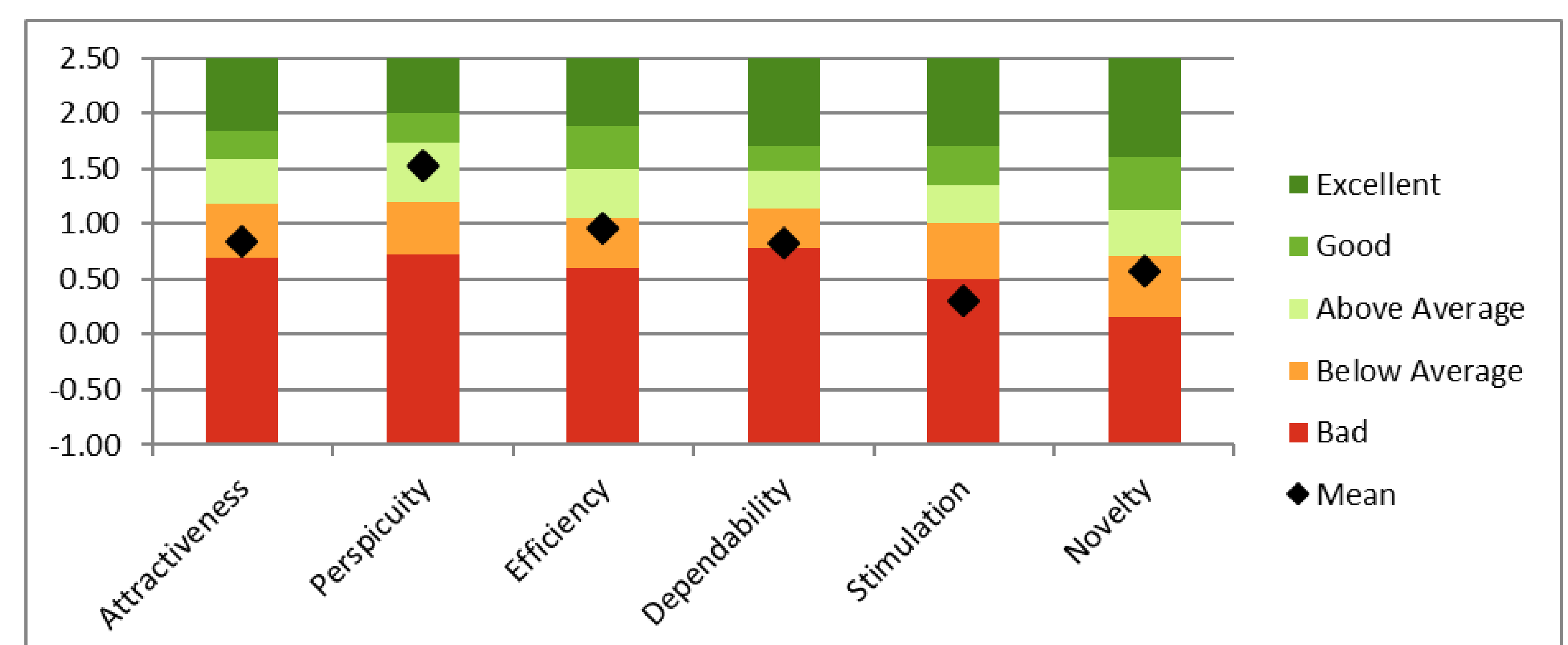


Fig. 3: UEQ score (mean; black rhombs) in relation to benchmark data (colored bars)

Discussion

- At this stage of development, technical bugs were to be expected. These mainly concerned the installation and registration processes. This might explain the low willingness to use the app.
- The application is easy to use. Excellent specificity and sensitivity are promising for a helpful tool usable in daily practice.
- A feasibility study with patients newly prescribed short-term PPI therapy will start in 2023.

Literature

- Muheim L et al. Potentially inappropriate proton-pump inhibitor prescription in the general population: a claims-based retrospective time trend analysis. *Therap Adv Gastroenterol* 2021; 14: 1756284821998928.
- Freedberg DE et al. The risks and benefits of long-term use of proton pump inhibitors: expert review and best practice advice from the American gastroenterological association. *Gastroenterology* 2017; 152(4): 706-15.
- Bangor A et al. Determining what individual SUS scores mean: adding an adjective rating scale. *J Usability Studies* 2009; 4(3): 114-23.
- Schrepp M, Hinderks A, Thomaschewski J. UEQ - User Experience Questionnaire [Available from: <https://www.ueq-online.org/>]



Corresponding author
kirstin.messner@unibas.ch
Pharmaceutical Care Research Group, University of Basel
Klingelbergstrasse 50, 4056 Basel, Switzerland
www.pharmacare.unibas.ch