

LAOLA – AN APP-DEMONSTRATOR FOR INTERACTIVE VOICE THERAPY

Sabrina H. Schröder, Verena Uslar, Navid Tabriz, Dirk Weyhe  
University Hospital for Visceral Surgery

Aim of LAOLA

Development of a Demonstrator App for Voice Therapy: In the future, speech therapists will use LAOLA to select the individual homework assignments for their patients by compiling a course from pre-produced exercise videos and sending it to their patients' smartphones. While using LAOLA, patients will receive direct feedback on their homework performance, based on visual information (e.g., mouth movement, jaw opening, body posture) and verbal voice data (e.g., hoarseness, volume). This feedback is provided using a machine learning algorithm developed specifically for LAOLA. To evaluate the success of the therapy, the results are stored in accordance with data protection regulations and presented to the patients to enhance their motivation. Currently, there is no AI-based app that generates therapy recommendations and provides biofeedback. Given the shortage of specialists in speech therapy and the increasing digitalization in the healthcare sector, the app has significant potential to simplify therapists' work and enhance the effectiveness of patient training.



Methods

The aim of this initial study within this project was to ascertain the experiential knowledge and opinions of potential app users for LAOLA. Various survey instruments were employed for this purpose. To gain an initial understanding, an online survey was conducted. Due to the low participation rate, the results were only utilized descriptively. Consequently, exclusively qualitative methods were employed, incorporating open-ended questions and, for Q2 and Q4, guidelines. The respective surveys have been designed on the basis of the results of the previous surveys. For the evaluation, the qualitative content analysis method, as outlined by Kuckartz & Rädicker (2018), was chosen for structuring the content.

| groups of probands & survey instruments       | sex       | age   |
|---|-----------|---|
| Q1: online survey at therapists (n=19)        | anonymous | anonymous                                   |
| Q2: focus group at therapists (n=5)           | 4 women   | between the ages of 28 and 63 (mean: 47)    |
| Q3: discussion at therapists (n=5)            | 5 women   | all 22 years old                            |
| Q4: one-to-one interviews with patients (n=6) | 5 women   | between the ages of 46 and 74 (mean: 62,16) |
| Σ: 35   | ♂1, ♀14   | Ø: 43,72                                    |



| Research Questions  |   |
|---|---|
| What features does LAOLA need to have in order to facilitate the treatment of dysphonia for speech therapists and patients? | How is the motivation of speech therapists and patients to use the app created and maintained in everyday life? |
| Audio recording   | Motivation is high in both groups. It can be promoted through:  |
| Stopwatch to measure the maximal phonation time   | Appealing design & easy handling  |
| Decibel measurement to control the voice volume   | Individually adjustable reminder function   |
| Time signature  | Information area and advices for "Stimmhygiene" to promote the health literacy                                  |
| Audio file (e.g. a dream journey)   | Voice diary for better self-assessment  |
| Timer Faded-in items in the videos  | Inclusion of gamification   |

Conclusions

- LAOLA could be an innovative tool for speech therapy, since it could make work and training more effective and efficient for speech therapists and patients.
- LAOLA should not impact on the amount of personal contact between speech therapist and patient.
- Patients do not want to feel controlled or pressured to perform through LAOLA.
- For further development, the inclusion of the motivation to use the app has priority.
- Due to the shortage of specialists, LAOLA is important for the telemedicine of the future.
- LAOLA should be expanded for the use in secondary prevention for speech professionals

References:  
Udo Kuckartz, Stefan Rädiker (2018): Qualitative Inhaltsanalyse - Methoden, Praxis, Computerunterstützung. Grundlagentexte Methoden, 5. Auflage, Beltz Juventa, Weinheim

