

# COPD: Pulmonary Rehabilitation can be delivered digitally

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## 1 Background

- COPD is **one of the leading causes of death** and disability worldwide.<sup>1</sup>
- **Pulmonary Rehabilitation** has a positive effect on disease progression and mortality, is cost-effective and recommended by international guidelines.<sup>2</sup>
- The supply of offline PR therapies **cannot meet** the increasing demand.<sup>3</sup>
- Novel **digital therapies** are promising solutions to fill this void.<sup>4</sup>

## 2 Method & Patients

- Kaia COPD provides a digital version of pulmonary rehabilitation and is **certified as a class-I medical device** in the EU.
- This paper **investigates anonymized data from users** of the Kaia COPD app on in-app retention and the change in clinical end-points during a period of 20 exercise days with the app:
  - COPD Assessment Test (CAT)
  - Chronic Respiratory Disease Questionnaire (CRQ)
- A paired t-test was used for statistical analysis.

## 3 Key Results

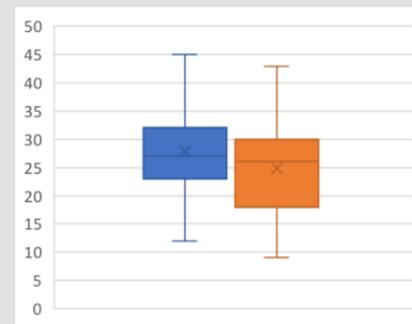


Fig. 1. Change in CAT from baseline to finish.

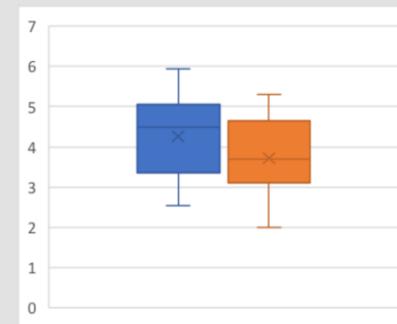


Fig. 2. Change in CRQ from baseline to finish.

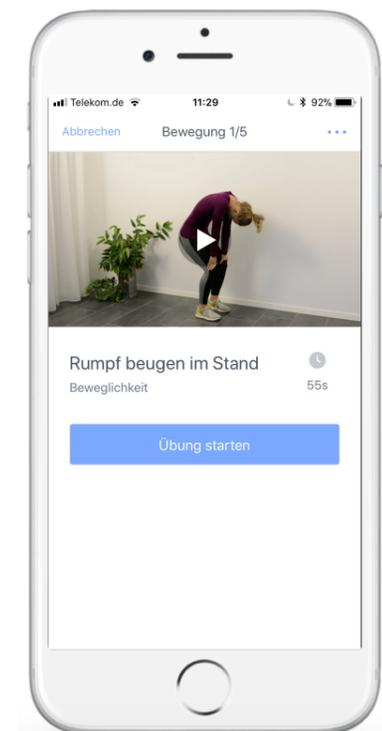
- Users who fulfilled inclusion criteria: 57
- Users who finished day 20 at the time of the analysis: 23 (40%)
- Mean age:  $59.9 \pm 9.4$ ; 74% females
- Average duration for 20-day core program completion:  $32.5 \pm 10.8$  days

- Users finishing the 20-day program reduced:
- CAT-scores (mean reduction 3.04 points from  $27.87 \pm 7.49$  to  $24.83 \pm 7.71$ ;  $p=0.013$ )
  - CRQ-scores (mean reduction 0.6 points from  $4.3 \pm 0.9$  to  $3.7 \pm 1.0$ ;  $p=0.003$ ) significantly.

## 4 Conclusion

Digitalizing pulmonary rehabilitation with a smartphone app **is feasible and accepted by patients**. The app leads to improved clinical outcomes **above the minimal clinically important** difference in patients completing a 20-day core-program. Patients

required on average **32.5 calendar days** to complete the core-program. At the time of writing **40% of patients finished the core therapy**. Further prospective studies have to adjust for potential bias and reproduce these results in a controlled setting.



## 6 References

1. <http://www.who.int/respiratory/copd/en/>
2. Casaburi R., ZuWallack R. (2009). Pulmonary rehabilitation for management of COPD. The New England journal of medicine, 360(13), 1329-1335.
3. Gloeckl R, Schneeberger T, Jarosch I, Kenn K: Pulmonary rehabilitation and exercise training in COPD. Dtsch Arztebl Int 2018; 115: 117–23.
4. Bourne S, DeVos R, North M, et al. (2017). Online versus face-to-face pulmonary rehabilitation for patients with chronic obstructive pulmonary disease: randomised controlled trial. BMJ Open, 2017;7:e014580.