# P57: The ENGAGED study: dementia prevention co-design for people living with depression

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**Background:** People living with depression are at increased risk of poor health outcomes, including dementia. Interventions to reduce dementia risk (dementia risk reduction (DRR)), include physical activity, diet and vascular health interventions. These can also benefit depressive symptoms and broader health, making DRR an important part of holistic mental health care for depression. However, enabling engagement and adherence, and embedding interventions in mental health clinician practice are ongoing challenges that limit the impact of interventions and implementation in clinical practice. Improved intervention tailoring and new approaches to intervention design and implementation are urgently needed. Co-design approaches have been shown to improve engagement and the impact of complex interventions in diverse fields, but have not previously been used in DRR.

**Objective:** The ENGAGED study will examine DRR intervention needs specifically for people living with depression, then co-design a tailored DRR intervention for use in mental health clinical settings.

**Methods:** The study will adapt a co-design model for mental health settings that emphasizes lived-expertise, and incorporate processes and evidence from behavioral science. Participants will include middle-aged and older people living with depression, and mental health clinicians.

Semi-structured interviews with both participant groups will examine unmet intervention needs. Illuminated shared experiences and themes will be explored further through focus group discussions to develop consensus intervention priorities. They will also be analyzed to produce a contextualized model of relevant behavior change.



https://doi.org/10.1017/S1041610223002442 Published online by Cambridge University Press

Participants and researchers will then work together to co-design intervention components and refine prototypes. Finally, mixed methods survey will evaluate the co- design process and participant experiences.

**Results:** This study will provide two key outputs to enhance future intervention tailoring and engagement:

1. 1) a pragmatic blueprint for DRR intervention with people experiencing depression across diverse mental health clinical settings, ready for evaluation and implementation
2. 2) a model of DRR behavior change that is specified to this population.

Evaluation findings will support methods development for applying co-design to cognitive and mental health research.

**Conclusion:** This research addresses the need for new approaches to tailored, integrated mental, physical and cognitive healthcare for people living with depression that emphasize stakeholder expertise and engagement to facilitate holistic support.

## P64: Wearable sensing technology for Parkinson's disease: preliminary results from the DIGI.PARK pilot

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**Background**: Assessment scales for motor symptoms in Parkinson's disease (PD) lack the sensitivity and resolution to monitor symptoms over time. Wearable sensors in people with PD have shown potential to assess motor symptoms. The DIGI.PARK study explores the use of consumer- and research-grade wearables such as Fitbit Sense (FS), Oura ring (OR) and Empatica E4 (EM) to track behavioral patterns and symptoms of PD over time.

**Method**: The DIGI.PARK pilot study (12.2021 to 12.2022) included N = 30 participants living in Bergen, Norway (N=15 persons with PD and N=15 controls). Outcome measures: self-reported diary of symptoms and behavior combined with data streams from three wearable devices (FS, OR, EM). Data was collected over 2 weeks: continuously by devices, and diary data every second day consisting of activities, sleep, medication timing (PD) and symptom occurrence (PD). The device data were segmented into 24-hour epochs. Heart rate (HR), heart rate variability (HRV), acceleration, blood volume pulse (BVP), inter-beat interval (IBI), electrodermal activity, metabolic equivalent of task (MET) and hypnogram were visualized as time series. The resulting graphs were annotated with the reported diary data and a manual checking procedure was applied to determine the correlation between sensor outputs and the logged instances of activity, sleep and symptoms.

**Results:** Self-reported behavior was discernable in the measurements of HR, EDA, BVP, HRV, acceleration, MET and hypnogram. We found considerable differences in device outputs regarding data type, data size, resolution, and periods of active measurements. Tremor symptoms were observable in the raw data provided by EM when worn on the affected hand. Behavioral patterns such as sleep, waking and physical activities were illustrated using aggregated data.

**Conclusion:** Sensor congruence with diary data support their usefulness for long term monitoring of behavioral patterns and symptoms in PD. For PD research, output from consumer- and research-grade devices have both shown usefulness. The choice of device should be tailored to the purpose and be mindful of the specific strengths



https://doi.org/10.1017/S1041610223002442 Published online by Cambridge University Press