

COMPARATIVE USABILITY EVALUATION OF A NOVEL PERITONEAL DIALYSIS ASSISTANCE DEVICE USING MOBILE EYE TRACKING

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BACKGROUND

- Patients in peritoneal dialysis (PD) have beside of their disease further **comorbidities** like diabetes, arthritis and more.⁽¹⁾
- This result in several limitations like **tactile and visual restrictions** or **dexterity shortfalls** or **cognitive impairment**.⁽²⁾
- Development of a **novel medical assistant device**
- This is only realisable by **continuously developing the user interface** of the medical device together with representative users.

OBJECTIVE

- Evaluation of the usability development
- Objectively comparing two different prototype status of a novel dialysis patient assistance device.
- Research questions:
 - (1) Is the **development** of the user interface continuously gone in the direction of a **safer and more efficient use**?
 - (2) Where are **the differences in the usability** of the **main interface features**?

METHODS

- Usability handling study using mobile eye tracking (see Figure 1)
- 9 representative **novice** participants
77% younger 65 years (av. 25 years),
23% older than 65 years (av. 73 years)
- Stimulus: most recent and older prototype version of the medical patient assistant device in the PD handling cycle (see Figure 2)



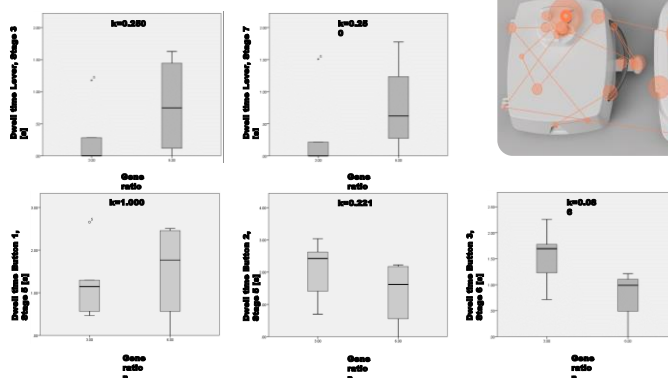
Figure 1: SMI Mobile eye tracking glasses, extracted from <https://finetone.com/in-tracking-glasses/>



Figure 2: Most recent prototype version

RESULTS

- The main user interface features of the device are the buttons and the lever on the right-hand side
- the challenges are comparable between the two user groups
- The **lever** is gazed at **less than one second** on average in the relevant handling stages for both versions
- **The buttons 2 and 3** of the most recent version are gazed at between 33 percent (1.36 / 2.03 seconds) up to 51 percent (0.75 / 1.53 seconds) on average shorter.
- **No significant differences** can be found, using the Mann-Whitney-U test ($k > p = 0.05$)



CONCLUSIONS

- The gaze data of the main user interface features indicate for both prototype versions a low level of cognitive load
- The usability of the lever is comparable for both versions
- The usability of the buttons of the most recent prototype version seem to need a lower level of concentration compared with the buttons of the older prototype version

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