Category :**Renal: extracorporeal support**

A100 - ***User experience (ux) study to evaluate clinical decision support system prototype supporting continuous kidney replacement therapy in a simulated icu environment***

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Introduction:

The increasing amount of data routinely collected on ICUs poses a challenge for clinicians [1] which is aggravated with data-heavy therapies like Continuous Kidney Replacement Therapy (CKRT). We developed the CKRT Supporting Software Prototype (CKRT-SSP), a clinical decision support system for use before, during and after CKRT. The aim of this user experience (UX) study was to prospectively evaluate CKRT–SSP on usability, user experience, and workload in a simulated ICU setting.

Methods:

We simulated CKRT treatments in a fully equipped ICU box and evaluated CKRT-SSP with validated questionnaires: System Usability Scale (SUS) [2] and User Experience Questionnaire (UEQ) [3]. Further, a modified NASA-TLX (task load index) [4] compared workload before and after using CKRT-SSP. A total of 12 clinicians and nurses participated in this study.

Results:

The SUS reached a median value of 87.5 for the CKRT-SSP, reflecting excellent usability. In the UEQ, CKRT-SSP scored clearly positive in the dimension attractiveness and the three task related dimensions perspicuity, efficiency, and dependability (95% CI fully > 0.8). For the two non-task related dimensions stimulation and novelty there was a positive trend (mean > 0.8, while lower limit of 95% CI < 0.8). The modified NASA-TLX showed a significant workload reduction in physical demand, effort, and frustration, see Figure 1.

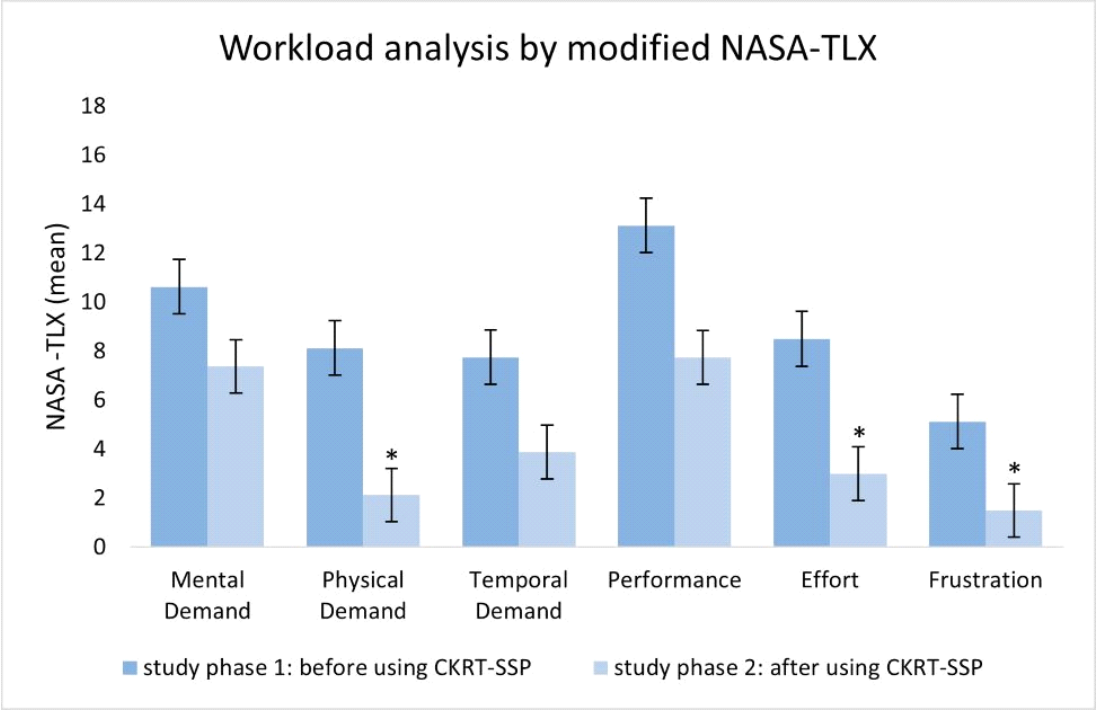
Conclusion:

CKRT-SSP is a promising tool for improving workload on ICUs and specifically application of CKRT. We obtained valuable insights for further user centric development.

References:

1. Manor-Shulman O et al. Journal of Critical Care 23:245-250, 2008
2. Brooke J in Usability evaluation in industry 189-194, 1996
3. Laugwitz B et al. Lecture Notes in Computer Science 5298:63-76, 2008.
4. Bustamante EA et al. Proceedings of the Human Factors and Ergonomics Society Annual Meeting 52:1522-1526, 2008

Image :



*Results of the modified NASA-TLX before and after using CKRT-SSP (mean and SD), * indicates statistically significant reduction by Mann-Whitney-U test*