Smart Glasses in Complex Care Environments, Initial Studies

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1. Introduction

Anesthesia and intensive care means health care in advanced, high-tech and complex care environments. The patients treated are often vulnerable and unstable. Daily efforts to provide safe and high quality care are being made, and technology development is part of this process [1,2]. Smart glasses is advised if timely access to information, mobility, continuous attention, and hands-free interaction is needed [3], which is often required in complex care environments. Smart glasses have been suggested to improve patient care, and patient safety, in other health care settings [4-6], but research from anesthesia- and intensive care is sparse. Hence, the overall aim of our initial studies was to describe specialized health care professionals' views of smart glasses before clinical use, and map existing research regarding use of smart glasses, in complex care environments.

Figure 1 Smart glasses (© Romare).

2. Methods

A qualitative approach was used. Data was gathered through focus group interviews [7,8], and a scoping review [9], and data was analysed using content analysis.

3. Results

Smart glasses were shown to have potential to be both a helpful tool, and a hindrance, in complex care environments. The results provide insights about what type of information specialized health care professionals wants smart glasses to provide, and how it should be presented to them. Continuous access to patient vital signs were, for example, seen as useful information.

"*At least pulse, rhythm, blood pressure, oxygen saturation, respiratory rate*" (Nurse anesthetist).

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Information provided in the smart glasses should be presented in a way similar to what health care professionals are used to, to avoid confusion.

> "*As similar to our existing monitor as possible*" (Intensive care nurse).

The results also indicate what technical requirements is needed for smart glasses to be a useful tool in clinical practice, such as battery life, voice control and connectivity. Finally, health care professionals' views on possible impact and affect, both on patient care, patient safety and on themselves as users, are being highlighted and discussed.

4. Conclusions

The results present valuable knowledge about smart glasses related to complex care environments. Smart glasses with a customized application might facilitate health care professionals' work in complex care environments, if developed and implemented in a prudent way. Smart glasses might increase access to patient vital signs, and are suggested to be used as a complement to existing monitoring routines and surveillance.

> *"...vital signs and things are important, but can never take away the value of actually seeing the patient"* (Anesthesiologist).

The hardware of smart glasses needs to meet the requirements from health care professionals to be useful in clinical practice. There are still challenges to this new technology, and more research is required before widespread implementation in complex care environments can be recommended.

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