Development and Evaluation of a Computerised Decision Support System for use in pre-hospital care

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The aim of the thesis was to develop and evaluate a Computerised Decision Support System (CDSS) for use in pre-hospital care.

The thesis was guided by a theoretical framework for developing and evaluating a complex intervention. The four studies used different designs and methods. The first study was a systematic review of randomised controlled trials. The second and the last studies had experimental and quasi-experimental designs, where the CDSS was evaluated in a simulation setting and in a clinical setting. The third study included in the thesis had a qualitative case study design.

The main findings from the studies in the thesis were that there is a weak evidence base for the use of CDSS in pre-hospital care. No studies have previously evaluated the effect of CDSS in pre-hospital care. Due to the context, pre-hospital care is dependent on protocol-based care to be able to deliver safe, high-quality care. The physical format of the current paper based guidelines and protocols are the main obstacle to their use. There is a request for guidelines and protocols in an electronic format among both clinicians and leaders of the ambulance organisations. The use of CDSS in the pre-hospital setting has a positive effect on compliance with pre-hospital guidelines. The largest effect is in the primary survey and in the anamnesis of the patient. The CDSS also increases the amount of information collected in the basic pre-hospital assessment process. The evaluated CDSS had a limited effect on on-the-scene time.

The developed and evaluated CDSS has the ability to increase pre-hospital patient safety by reducing the risks of cognitive bias. Standardising the assessment process, enabling explicit decision support in the form of checklists, assessment rules, differential diagnosis lists and rule out worst-case scenario strategies, reduces the risk of premature closure in the assessment of the pre-hospital patient.