D1.1: Human Factors as a Key Component in Mass Casualty Response

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Abstract:
Introduction: There is no clear ‘gold standard’ for measuring the efficacy of information decision support systems used in mass casualty events. The purpose of this research was the preliminary validation of a comprehensive Mass Casualty Conceptual Model (MCCM). This research examined key relationships among factors needed to provide real-time visibility of data that track patients, personnel, resources, and potential hazards that influence outcomes of care during mass casualty events. Vicente’s Human Factor’s Model provided the structure for studying the fit of technology to the workforce during mass casualty events. Indicators to measure technology include ergonomics, functionality, work flow patterns, rates and amount. Identification of human and societal needs at the individual, team, and organizational levels are included in the model.

Method(s): Internet and email applications facilitated a modified Delphi technique through which experts provided initial validation for the model. A purposeful sample of 18 experts who work in the field of emergency preparedness was selected from across the U.S. Research questions addressed the extent to which experts agreed that constructs, relationships and indicators provided valid measures during mass casualty events.

Results: Two rounds of the Delphi process were needed to satisfy the criteria for consensus and/or stability related to the constructs, relationships and indicators in the model. Discussion around the Technology Construct considered whether ergonomics is an important indicator during a mass casualty event. Several experts indicated the need to consider redundancy, utility
power needs and connectivity for computer applications; these variables were added to the model. All other indicators to measure technology sufficiently satisfied the criteria for consensus or stability.

**Discussion & Conclusions:** This study provides a foundation for understanding the complex context in which mass casualty events take place and the factors that influence outcomes of care. Human factors play a key role in the design of information decision support systems. Future research is needed to test the model as a framework for studying effects and outcomes of mass casualty events.

**Abstract History:**
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