Information Needs of Pre-hospital Care Providers – A Requirements Analysis
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Abstract: To assess information needs of Emergency Medical Services (EMS) personnel and the potential of electronic decision support tools, we surveyed 39 paramedic students and practicing EMS personnel. We found frequent use of paper-based tools, with imperfect accessibility and ease of use. Potential electronic decision support tools were rated as helpful, but some alerts were rated low. The results may be helpful in design, implementation and research of electronic decision support tools for EMS.

Introduction: With the growing acceptance of electronic tools for documentation of patient care in EMS, there is a potential for augmenting these tools with electronic decision support, which can help reduce error rates and improve compliance with patient care protocols. This study was undertaken to find areas of information need of EMS personnel and their attitudes towards potential electronic decision support tools.

Methods: We developed a questionnaire consisting of 25 questions, exploring four major areas: demographics, use of existing paper-based tools, perceived need for alerts and reminders in common EMS conditions, and acceptance of electronic decision support tools. The questionnaire was pilot tested on EMS faculty at UAB. Approval was obtained from UAB’s Office of Institutional Review Board. Two populations of EMS personnel were recruited: students enrolled in Paramedic courses at UAB in Fall 2006 semester, and practicing EMS personnel who brought patients to UAB’s Emergency Department during October-November 2006. Filled forms were collected by EMS faculty teaching the paramedic courses, or mailed to the investigators by the practicing EMS personnel. Their responses were analyzed using SPSS® 13.0.

Results: A total of 33 paramedic students and 32 practicing EMS personnel accepted the questionnaires, of whom 32 students (97%) and 7 EMS personnel (22%) returned the filled forms. A majority of the 39 respondents were male (82%), white (85%) and had some college education (85%). Mean age was 28 ± 7.2 years. Ninety five percent of the respondents were employed as EMS care providers at the time of the study. They had worked for an average of 5.95 ± 5.2 years and went to an average of 23.5 ± 15.5 runs (patient encounters) every week at the time of the study. Directory of phone numbers was found to be the most common paper-based tool available (87% of respondents), and most frequently used (85% of those who had the directory used it every 20 runs or more frequently), compared to the same parameters for other paper-based tools: paper booklet of protocols (84% and 50%), drug reference manual (70% and 52%) and HAZMAT manual (78% and 13%). The mean overall rating of these tools was 3.7 ± 1.3 for accessibility, 3.7 ± 1.3 for ease of use and 4.2 ± 1.1 for reliability, on a scale of 1-5. The respondents reported that alerts for equipment malfunction and incorrect drug administration will be most helpful (4.5 ± 0.9 and 4.4 ± 1.0, respectively, on a scale of 1-5), followed by deterioration in patient’s vital signs (4.2 ± 1.2), checking oxygen saturation after endotracheal (ET) intubation (3.7 ± 1.5), checking correct placement of ET tube (3.7 ± 1.5), checking glucose level of unconscious patient (3.5 ± 1.5) and immobilizing patient with suspected spinal cord injury (3.0 ± 1.7). All the proposed decision support tools were rated as helpful by the respondents: triage (3.7 ± 1.3 on a scale of 1 to 5), choosing correct protocol (3.8 ± 1.3), suggestions for history and assessment (3.8 ± 1.2), treatment suggestions (4.1 ± 1.1) and feedback after completion of case (3.9 ± 1.3). In addition, respondents ranked reliability and ease of use over integration and fit with workflow in a list of features they would look for in a new electronic tool.

Conclusions: Several paper-based tools are frequently used in EMS, but some have problems with accessibility and ease of use. Not all alerts and reminders may be equally helpful for EMS providers, but several kinds of electronic decision support tools were viewed favorably. The results of this study can potentially help design new decision support systems, aid in implementation of such systems, and provide a framework for further research in this area.

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