



## The knowledge desired by emergency medical service managers of their ambulance clinicians – A modified Delphi study



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### ABSTRACT

**Aim:** The aim of the study was to identify the types of knowledge that Swedish Emergency Medical Service (EMS) managers considered desirable in their Ambulance Clinicians.

**Background:** Emergency medical service managers are responsible for organisational tasking and in this are dependent on the knowledge possessed by their ambulance clinicians. It would therefore be of value to explore EMS managers' approach to this knowledge.

**Design:** A modified Delphi method in three rounds.

**Methods:** In total thirty-six EMS managers participated, and twenty-four finished all three rounds. They were encouraged to rate each sub-category, and the ten with the highest mean were interdependently ranked in the final round.

**Results:** Five categories and twenty-six sub-categories emerged in the first round, covering knowledge related to; contextual aspects, medical and holistic assessments, formal education and organisational issues. Eventually, the sub-category 'Knowledge to assess the patient's situation from a holistic perspective' was the highest ranked, followed by 'Medical knowledge to assess and care for different diseases' and 'Knowledge to be able to care for critically ill patients'.

**Conclusions:** Taken together the knowledge areas address essentially medical care, contextual aspects and nursing. The boundaries between these can sometimes be seen as elusive, calling for ambulance clinicians to balance these areas of knowledge.

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## 1. Background

Managers are responsible for making decisions on objectives, strategies, operational procedures and allocation of resources [1]. Organisational objectives within health care are found to be based on models focusing on organisational efficiency [2]. In order to achieve this efficiency in Emergency Medical Services (EMS) care is often focused on time spent in different phases of care rather than the quality of care that ambulance clinicians (ACs) want to

provide [3]. Care provided in EMS organisations is usually based on treatment guidelines and protocols, which limits an independent professional freedom of action. Consequently, Nordby [4] found in a study on EMS managers that communication with the ACs mainly concerned making sure that the practical aspects of treatment conformed to operational procedures.

Usually a Swedish team of ACs consists of two registered nurses or one registered nurse and one emergency medical technician (EMT). There are two levels of ambulance nurses working in the EMS: 1) registered nurses (Bachelor of Science degree) and 2) registered nurses in specialist nursing, prehospital emergency care (specialist course, one-year Master of Science degree). Registered nurses comprise approximately 80% of Swedish ACs and the remainder consists of EMTs [5]. EMTs in Sweden are mainly assistant nurses with three years of college education [6]. All ambulances in Sweden are advanced life support units and protocols are commonly used in order to manage the care for ambulance patients. At the same time, while stepping out of their strictly

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protocol guided roles, ACs have been found to have a positive impact on patient care [7].

In Sweden the county councils and the EMS managers have overall responsibility for ambulance care (provided by the county councils themselves or outsourced to private companies) and the ACs competence and education to provide prehospital emergency care [8]. Swedish EMS managers consist of operations managers (with overall responsibility for the organisation) and first line managers (with mainly an executive responsibility) [9]. Hence, EMS managers may to a certain degree be responsible for the development and maintenance of ACs' knowledge. Parts of this knowledge in the EMS may be related to medical evidence and its use in the ACs' assessment and treatment skills [10], and to making this evidence accessible and easy to understand for the ACs [11]. This can be understood as one type of practical knowledge. Schön [12] suggests that practical knowledge is intuitive, spontaneous and situational. Practical knowledge is also described as the ability to follow rules in situations where there are no rules to follow, finding the common denominator in apparently diverse experiences [13]. Being an AC in the prehospital care setting is described as being prepared for being unprepared [14], making decisions and providing care independently without the close back-up of a doctor or other health care professionals [15]. In addition Campeau [16] points out how ACs act in accordance with evidence-based medical protocols and simultaneously control prehospital environments where emergencies occur, in order to create a setting where advanced emergency care can be administered. This requires knowledge to provide advanced care and to control the physical environment but also the social environment while interacting with patients, significant others and other professionals. One way to understand this as knowledge, involves the ACs' ability to balance the encounter with the patient as an objectified recipient of medical care and as a unique human being [17]. Hence, knowledge in EMS may be described as embracing explicit formal education [18], protocol dependent [19] and containing tacit experienced-based dimensions [20].

In conclusion, ACs are responsible for patient care of a specific human being in a unique and also urgent situation. On the other hand the ambulance care may be managed with a focus on organisational efficiency from a general care perspective. However, ACs' knowledge has an important bearing on the EMS manager's responsibility for the organisation's aims and tasks. This may have impact on the understanding of what kind of knowledge EMS managers prefer their ACs to have. In addition, to understand ACs as professionals within the EMS organisation, the managers' perspective on the ACs knowledge is important. The aim of the study was therefore to identify the types of knowledge that Swedish Emergency Medical Service (EMS) managers considered desirable in their Ambulance Clinicians.

## 2. Methods

### 2.1. Design

A modified Delphi method was used [21] for this study. The Delphi method emanates from the assumption that the opinion of a group, which in this case comprised a panel of EMS managers, is more valid than individual opinions. The Delphi process uses open-ended questions within a panel of experts in order to generate questionnaires, with the aim of reaching consensus within this panel. The present study, using a panel of EMS managers in order to reach consensus about and rank desirable knowledge among ACs, was conducted over three rounds in spring 2015. A Delphi method has no universally agreed guidelines and can therefore be flexible depending on the study's aim [21].

### 2.2. Recruitment and respondents

EMS websites covering both county councils and private ambulance companies were searched to retrieve contact information for EMS managers (both operations and first line managers). Every person found with the title of manager ( $n = 132$ ) received an email giving information about the study and asking if he/she would be willing to participate. The managers sent their consent by responding to the email. This study represented the total population of the EMS managers in Sweden at the time of data collection.

One essential aspect of a Delphi study is to retain the whole group throughout the study [22], hence the response rate was calculated from the participants who initially agreed to participate [23]. The number of respondents completing all three rounds was judged as sufficient for a Delphi study [21]. Of the managers who agreed to participate the response rate was 83–90% in each round, which is considered adequate to maintain methodological rigour [21]. The response rate was 67% for those respondents who finished all three rounds, which is considered high for this type of study.

### 2.3. Procedures

The participants received written information about the study, the aim and the data collection procedures. The study was conducted on-line using web-based questionnaires (SurveyMonkey®) over three rounds. The respondent received an email with an individual Internet link to the questionnaire for each round of the survey. The data was collected by the first author (MH).

#### 2.3.1. Round 1

The first questionnaire included questions on demographic data and one open-ended question; "Which knowledge do you wish your ACs to have?" The answers were put into a single text document and analysed using inductive qualitative content analysis in line with Elo and Kyngäs [24]. Words and phrases were extracted and coded ( $n = 205$ ) to systemize the data into categories. Similar codes were grouped together in order to let sub-categories and categories emerge. Sub-categories and categories were formulated with the ambition of remaining close to the concepts and words used in the managers' answers. Eventually 26 sub-categories and 5 categories emerged (Table 2). In order to achieve acceptable methodological quality the analysis was an on-going process involving all authors, and was reviewed and discussed with other researchers at seminars.

#### 2.3.2. Round 2

A questionnaire for the second round was developed, using the 26 sub-categories from the first round as areas of knowledge. The questionnaire was introduced with the following question; "How do you rate the importance of the following knowledge areas of ambulance clinicians?" The managers were encouraged to rate the importance of each sub-category using a seven-grade Likert scale, ranging from (1) not important to (7) very important (Table 2). There was a high level of rating and consensus in the second round and in order to identify desired knowledge areas the format of the survey was changed for the third round. Consensus in Delphi studies has been defined in a variety of ways, which might be seen as a methodological weakness [25]. In the present study consensus was deemed to be high in round two, and in line with the aim respondents were asked to interdependently rank the different sub-categories in the final round.

#### 2.3.3. Round 3

The third questionnaire was developed using the ten areas of knowledge with the highest mean value from round two. The man-

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