International Emergency Nursing 32 (2017) 15-19

Contents lists available at ScienceDirect

International Emergency Nursing

journal homepage: www.elsevier.com/locate/aaen

The first single responders in Sweden – Evaluation of a pre-hospital single staffed unit



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ARTICLE INFO

Article history: Received 23 October 2015 Received in revised form 9 May 2016 Accepted 19 May 2016

Keywords: Single responder Ambulance delays Low-priority cases Waiting times Sweden Working environment Emergency nurse

ABSTRACT

Background: Single responder (SR) systems have been implemented in several countries. When the very first SR system in Sweden was planned, it was criticised because of concerns about sending single emergency nurses out on alerts. In the present study, the first Swedish SR unit was studied in order to register waiting times and assess the working environment.

Method: Quantitative data were collected from the ambulance dispatch register. Data on the working environment were collected using a questionnaire sent to the SR staff.

Results: The SR system reduced the average patient waiting time from 26 to 13 min. It also reduced the number of ambulance transports by 35% following triage of patient(s) priority determined by the SR. The staff perceived the working environment to be adequate.

Conclusion: The SR unit was successful in that it reduced waiting times to prehospital health care. Contrary to expectations, it proved to be an adequate working environment. There is good reason to believe that SR systems will spread throughout the country. In order to enhance in depth the statistical analysis, additional should be collected over a longer time period and from more than one SR unit.

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Introduction

One major challenge for pre-hospital care is to adapt ambulance resources to the actual needs of the community. In order to improve pre-hospital service in rural areas far from ambulance services, a single responder (SR) system has been implemented in several countries.

In this article, the first SR system in Sweden was studied. The definition of SR system in this context is a car equipped like an ambulance (basic as well as advanced life support) and staffed with one emergency nurse that responds to a call, but is not equipped to transport patients. The results of the study suggest good reasons to presume that the SR system will become a trend in Sweden as well as the rest of Scandinavia. The aim was to study waiting times and the work environment of the first Swedish SR system.

Background

It is known that ambulance services have become increasingly busy. The British Health and Social Care Information Centre performance reports for 2014–15 showed that ambulance calls had

* Corresponding author. E-mail address: eric.carlstrom@gu.se (E. Carlström). increased by 6% in a year. The figure was up from 5.6 million 10 years ago and 2.6 million 20 years ago (Health & Social Care Information Centre, 2015). In Sweden, where the data for this study were collected, ambulance transport increased by 9% from 2009 to 2011. A closer look showed that high-priority transports increased more than low-priority transports (Riksrevisionen, 2012). Another study of ambulance services in Sweden revealed that, over a 15-year period, the waiting time for an ambulance in drowning accidents increased by 3.5 min (Claesson et al., 2012).

Another study on drowning accidents showed that the cost of a 5-min extra delay was approximately 32,000 USD of societal costs (Jaldell, 2004). Clearly long waiting times have proven to be costly and the need for immediate care is at cross-purposes with the gradually increasing waiting times.

It has been shown that ambulances are often used for lowpriority patients whose medical needs could be handled differently. Snooks et al. (2002) reported that more and more patients are demanding ambulance transportation regardless of whether they fulfil the criteria for such services. One major problem is that there are comparatively few alternatives to ambulance transportation in the project municipality. Some alternative models, such as mobile advisory units, have been suggested for use in lowpriority cases (Palazzo et al., 1998). Snooks et al. (2002) suggested that even if an ambulance has arrived on the scene, other types of





services can still be considered for transporting the patient to a hospital in order to save costs (Ek and Svedlund, 2014).

The healthcare system in Great Britain is often compared to that in Sweden. Both countries offer public, tax-financed Beveridgeinspired healthcare (Musgrove, 2000), but Great Britain, in contrast to Sweden, has a broadly implemented SR system that has inspired development of similar organisations in other European countries such as Germany, Switzerland and the Netherlands (Carney, 1999). One successful example is St. John's Community First Responder (CFR) in London, which organises voluntary local teams of responders who are alerted simultaneously with the ambulance in the event of high-priority cases. Another group of SRs in Great Britain is the so-called staff responders, i.e. professional prehospital staff who volunteer to be on call in their homes (NHS, 2013a; Saint John Ambulance, 2013).

In the United States, the SR approach is represented by "Rapid Response Teams" (RRT), i.e. a variety of different professionals who work on a voluntary basis and are alerted to accident scenes in their neighbourhood. The RRT teams are often specialised, accordingly trained and well equipped to act as first responders until the ambulance arrives (Thomas et al., 2007). The US also has a long and well-functioning tradition of SRs consisting of trained paramedics equipped to perform advanced pre-hospital procedures, such as resuscitation and intubation during high-priority alerts (Cone et al., 2012).

A British equivalent to RRTs is a system with well-equipped and trained professional SRs who perform assessments, determine the need for ambulance transport and are able to provide care, give advice or refer the patient to the proper level of care. These SRs are also qualified to determine priority levels and can, if appropriate, cancel already alerted ambulances. They transport themselves to the scene in specially equipped cars, on motorcycles and even bicycles in densely populated areas. In London, SRs on bicycles are equipped with a defibrillator, oxygen, nitrous oxide, vital parameter surveillance equipment, manual resuscitators for adults and children, IV sets and drugs optimised for the most common high-priority conditions (NHS, 2013b).

The occurrence of such professional SRs is growing. The tendency is towards a preference for well-equipped and trained professionals over volunteers, i.e. rudimentarily equipped (NHS, 2013b). The idea is to let competent staff alert ambulances or other specialised resources when needed (Morrison, 2011).

Few have studied the organisation and function of SRs. Most studies involving SRs have explored the potential for saving time in cases of cardiac arrest (Hamner, 2012). There is strong agreement on the value of rapid arrival, assessment and treatment (Hollenberg et al., 2009). Short distances, automatic defibrillators and basic knowledge in CPR have promoted the establishment of SRs, especially in densely populated areas (van Alem et al., 2003).

In one of the few such studies of early response in rural areas, a police department in Indiana, USA was equipped with automatic defibrillators. Out-of-hospital cardiac arrest survival rates were not improved during this project (Groh et al., 2008). In another study from California, US, child trauma alerts occurring in densely populated areas were compared with those occurring in rural areas. The study showed 64% (P = 0.001) more trauma calls among children in rural areas than in cities. Based on the results, the authors emphasised the need for SRs in rural areas (Seidel et al., 1991). In a study from north-western Switzerland by Saner et al. (2013), SRs located in rural areas reached the patient within six minutes (range 3–9) and ambulances within 12 min (range 7–17) from the time of the call. The study revealed a significantly higher survival rate among patients suffering from heart attacks when SRs were involved in the care.

Another effect of using SRs is the optimisation of ambulance resources. Nakstad et al. (2009) studied the effect of SRs on motorcycles in Oslo, Norway. The SRs cancelled 23.5% of the dispatched ambulances. Another effect was that the SRs acted to support the ambulance staff during challenging manoeuvres, such as CPR. In similar studies, ambulances were cancelled in 18% of cases as an effect of SR presence in Portugal (Soares-Oliveira et al., 2007), and Turner and Nicholl (2002) described how SRs in rural areas in Great Britain reduced ambulance transport by 20%.

SRs normally work alone in a pre-hospital context. Having to work on your own may make recruitments for a SR post more difficult. The risk of patient violence on nursing staff has mostly been studied in psychiatric wards (Flannery et al., 1994; Ito et al., 2014) and emergency departments (Baydin and Erenler, 2014). However, few researchers have studied assaults on pre-hospital staff. One exception is a study from Iran, where approximately 75% of the pre-hospital staff surveyed had experienced at least one form of work place violence within the last 12 months. Violence resulting in serious injuries was reported by 4% of the participants (n = 103) (Rhamani et al., 2012). In another study, based on data from New England, 80% (n = 196) of pre-hospital staff reported physical assaults. Fear of personal safety was reported by 68%.

The aim of the study was to compare ambulance response times before and after the introduction of an SR system and to explore job satisfaction of the SR:s (Carlström, 2014).

Method

Context of the study

The studied SR system was located in a rural community known to be one of the most distant from access to ambulance transport among the 15 municipalities in a Hospital Group in western Sweden, an area with a population of almost 273,000 inhabitants. It was assessed during a 4-month period in 2013. During the summer holiday period, a few more SR systems were temporarily located in tourist-dense areas of the 15 municipalities. Before the project onset, the nursing union criticised the project by voicing concerns about sending single emergency nurses out on alerts. They were worried about emergency ambulance nurses, i.e. "registered emergency nurses specialised in ambulance care", working alone in dangerous situations and being exposed to threats or violence. They therefore recommended the responder vehicles to be staffed with two emergency nurses (Andersson, 2013; Bohuslänningen, 2015).

The ambition of the healthcare stakeholders was that the average time from alert to ambulance arrival should not exceed 12 min. At the time, the average was 17.2 min in the studied area and 26 min in the municipality where the SR system was located.

Another ambition was that the time from call to arrival in highpriority, i.e. "red" alerts should be no more than 20 min in 90% of all cases. However, not more than 64.3% of cases in the studied Hospital group achieved this goal, and the corresponding figure for the municipality where the SR system was located was 21.8%.

The SR system was situated in the same building as the fire department. A protocol was established indicating that the SR system should be alerted at priority 1 and 2, on a 3-degree scale, i.e. high-priority and medium-high-priority cases. Simultaneous ambulance alerts ensured later support for the SR.

Highly competent registered nurses, experienced in prehospital care and ambulance services, were recruited to the SR project. Cars were purchased and equipped like an ambulance, though without a stretcher. The SR system did, however, provide advanced life support to patients until the arrival of an ambulance, which transported the patient to an appropriate facility.

The SR project was to be evaluated by analysing data for the last four months of 2013, i.e. September to December, and comparing them to data for the year before the SR system was implemented, Download English Version:

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