

# The Decision Support System and Conventional Method of Telephone Triage by Nurses in Emergency Medical Services: A Comparative Investigation

Mohammad Parvaresh Masoud, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

Mahdi Kashani Nejad, Emergency Medical Center, Qom University of Medical Sciences, Qom, Iran

Hamid Darebaghi, Emergency Medical Center, Qom University of Medical Sciences, Qom, Iran

Mohsen Chavoshi, Emergency Medical Center, Qom University of Medical Sciences, Qom, Iran

Mahdi Farahani, Emergency Medical Center, Qom University of Medical Sciences, Qom, Iran

## ABSTRACT

The demand for medical emergencies often begins with a call to a dispatch center. An appropriate performance of this unit influences providing effective services significantly. This study aimed to compare the effect of using revised New Jersey telephone triage manual as a Decision Support System and the conventional methods on the time duration of mission taking and the performance of emergency medical dispatchers which were done by 115 emergency nurses of Qom, Iran, in 2012. This quasi-experimental study aimed to compare the effects of two methods on the performance of nurses of Qom. Conventional (September and October) and DSS data (December and January) were extracted and compared. November was skipped due to nurses' familiarity with the program. Performing the new method improved the overall performance significantly ( $P < 0.05$ ). The DSS method increased the appropriate performance and decreased inappropriate performance significantly, but in the time duration of mission taking there was no a significant difference comparing two methods ( $p = 0.342$ ). This method has been shown to improve both patient outcomes, as well as the cost of care.

## KEYWORDS

Decision Support System, Emergency Medical Dispatch, Emergency Medical Service, Telephone Triage

## INTRODUCTION

Emergency medical service (EMS) is a comprehensive system which makes an effective relationship between staff, equipment, and facilities. EMS aims to provide effective medical and immunity services which should be presented coordinately and timely to the victims of the diseases and events (Cone, Brice, Delbridge, & Myers, 2014; Mistovich, Karren, & Hafen, 2013; Moore, 1999). Medical emergencies are the first cause of contact by the majority of people with the health systems in emergency and life-threatening cases; it is as the goalkeeper of accessing to the secondary and tertiary services. This system is enjoying new and advanced technologies to take care of the patients and injuries (Phillips, 2015; Roudsari et al., 2007). EMS lead agencies should produce and maintain an EMS communications plan system that integrates the EMS agencies with the major communication

DOI: 10.4018/IJEBR.2018010105

system assets for daily and disaster use. The EMS office should be aware of all voice, video, telemetry and other data communications that can be used for real-time information management for patient's care. The communications plan should include public access to EMS system through 9-1-1, and the plan should consider statewide interoperability of communications and communication through radio systems, cellular, voice-over internet protocol, automatic crash notification and patient's alerting devices (Cone et al., 2014). The concept of providing emergency care for serious illness is one of the measures of a civilized society. Throughout the world, the emergency medical systems have been focused on the delivery of care to life-threatening emergencies. The provision of organized prioritization and dispatching systems is the first step in the delivery of emergency medical support in the prehospital setting. Like other resources within the health care system, the capacity of EMS is not unlimited. There is thus a need for optimizing the utilization of the EMS system (Castrén et al., 2008; Fessler, Simon, Yancey, Colman, & Hirsh, 2014).

Chain of pre-hospital cares is started by calling the EMD. It is a situation which associated with different degrees of stress and anxiety of the caller; some conditions which can distort receiving accurate and complete information (Bång, Örtgren, Herlitz, & Währborg, 2002; Cone et al., 2014; Forslund, Quell, & Sørli, 2008). EMD is defined as the "reception and management of requests for emergency medical assistance in an EMS system" (Clawson & Dernocoeur, 1998). It involves two broad aspects of work: call-taking, where calls for emergency medical assistance are received and prioritized; and controlling, where the most appropriate ambulance is dispatched to the emergency and ambulance resources are optimized in their areas of operations. An EMD is a professional telecommunicator, tasked with the gathering of information related to medical emergencies, the provision of assistance and instructions by voice, prior to the arrival of EMS and the dispatching and support of EMS resources responding to an emergency call. In most modern EMS systems, the EMD will fill a number of critical functions. First of all is the identification of basic call information, including the location and telephone number of the caller, the location of the patient, the general nature of the problem and any special circumstances. In most EMS systems, the telephone remains almost a singular point of access for those needing assistance. Calls will be prioritized by EMD based on medical information and other health-related information. The operator offers some advice to the caller and informs the ambulance staff regarding the situation at the scene at the same time (Crowther & Williams, 2009; Mistovich et al., 2013).

Emergency medical dispatch (EMD) systems can help ambulance services to determine the urgency of an incident, the speed of response necessity, the level of support needed and offer pre-arrival instructions to callers. This has the potential to increase user satisfaction with the prehospital ambulance services by meeting unmet demand for first aid information and general information (Ellensen, Wisborg, Hunskaar, & Zakariassen, 2016; O'Cathain, Turner, Withers, & Nicholl, 1998) and improve patient's care by providing vital assistance while awaiting an ambulance or the potential to increase dissatisfaction by increasing the interaction time between the operator and the caller (Culley, Clark, Eisenberg, & Larsen, 1991; Ek & Svedlund, 2015). During the last 35 years, it has become apparent that the 9-1-1 dispatcher can rapidly elicit reasonably accurate sign and symptom information from frightened callers, allowing more accurate medical categorization of patients (D. Cone et al., 2014; Heward, Damiani, & Hartley-Sharpe, 2004; Roberts, 1978). In addition, the dispatcher can activate the configuration of responders optimally suited to deal with the specific emergency. It is not enough to mindlessly send paramedics or first responders in all cases; it is necessary to accurately determine the need for these highly trained individuals (Bailey, O'Connor, & Ross, 2000; Ek & Svedlund, 2015). If this is not done for all calls, the number of available providers will be reduced because of their inappropriate use (Curka et al., 1993).

The key role for the dispatcher was defined in 1978 when Salt Lake City Fire/EMS identified the medical dispatcher as the "weak link" in the chain of survival. The role of the dispatcher in a modern EMS system is extensive, with at least seven sub-roles: interrogator, radio dispatcher, triager, logistics coordinator, resource provider, psychological calmer and pre-arrival aid instructor. The basic

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