

Research Literacy Among Emergency Dispatchers at an Emergency Communication Center: Developing Capacity for Evidence-Based Practice at Dispatch (A Pilot Report)

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ABSTRACT

Background: Expanding the role of evidence-based practice (EBP) in emergency medical services is a matter of increasing importance to researchers and practitioners alike. However, this movement toward EBP has not yet been applied to one critical area of prehospital care: emergency dispatching. The primary reason for this gap is that emergency dispatchers (EDs) struggle to develop a research culture able to produce enough well-conducted studies to move toward true EBP. One starting point with documented potential for building the research capacity in a field is to develop practitioners' familiarity with research concepts—their "research literacy"—via a research literacy intervention.

Objectives: The objective of this study was to determine EDs' levels of research literacy, as well as their willingness and ability to participate in research.

Methods: The prospective, nonrandomized cohort study consisted of a pre-intervention survey, an instructional video about research (intervention), and a post-intervention survey.

Results: Of the 85 EDs at study site, 68 (80.0%) participated in the study. A majority (60.3%) had at least read research related to their respective fields. The video increased several aspects of the EDs' research literacy, particularly their knowledge about some of the specific characteristics of research.

Conclusions: Emergency dispatchers do read work-related research publications, and they are interested in participating in dispatch research. An educational research video appears to be an effective vehicle to increase emergency dispatchers' knowledge-base about research and level of interest in participating.

INTRODUCTION

Defining and expanding the role of evidence-based practice (EBP) in emergency medical services (EMS) is a matter of increasing importance to researchers and practitioners alike.¹⁻⁴ Although definitions of EBP differ, the most commonly cited derives from the definition of evidence-based medicine, which is "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients."⁵ EBP, in other words, involves the gathering, evaluation, and application of the best-available research results for the purpose of optimizing outcomes in any field. Although evidence-based medicine was first defined in 1992, EMS has been slow in adopting evidence-based approaches, largely because the research base in EMS has simply not been large enough or grown fast enough to support them.⁶

Recently, this has begun to change. In 2008, the U.S. Federal Interagency Committee on EMS (FICEMS) and the National EMS Advisory Council (NEMSAC) organized the first National EMS Evidence-Based Guidelines Conference, bringing together stakeholders and experts to begin the process of developing evidence-based guidelines for practice in the EMS community.⁴ Since then, guidelines have been developed in a number of areas of prehospital medicine, with one peer-reviewed journal recently devoting an entire special issue to the subject.^{4,7-11} However, this movement toward EBP has not yet been systematically applied to one critical area of prehospital care: emergency dispatching.

The practice of emergency dispatch has not yet generated sufficient research to rely completely on EBP. Systematic research in emergency dispatch has been sparse and has focused almost exclusively on a few high-visibility topics (such as the provision of telephone CPR) rather than on the development of an understanding of comparative outcomes among competing EMD practices.¹²⁻¹⁴ As in other professional and medical fields, the aim of emergency dispatch should be the development of an evidence base both broad and deep enough to develop and support EBPs. However, emergency dispatchers (EDs) and dispatch researchers have struggled to develop sufficient well-conducted studies to move toward true EBP. Two of the primary barriers to the undertaking of this aim have been the small number of researchers and the lack of a “culture of research” in the field of emergency dispatch. To develop such a culture, ED will need to do what social work, education, and other fields have done in the past 20 to 30 years: develop a broad network of practitioner researchers.¹⁴⁻¹⁵ Practitioner researchers are professionals working in the field—in this case, EDs—who either collaborate with researchers or learn to conduct studies on their own. The value of practitioner research is clear: conducting research moves practitioners toward acceptance of EBPs when they are developed; practitioner research tends to be more practically-oriented and takes on questions of interest to other professionals in the field; and conducting research gives practitioners a broader understanding of their own work and the reasons for their administrators' decisions.^{14,15,18}

There are, however, significant barriers to developing a network of practitioner researchers in any field, including resistance from practitioners themselves and cultural barriers between researchers and practitioners, as well as lack of organizational support.^{16,17} One starting point with documented potential for overcoming these barriers and building the research capacity in a field is to develop practitioners' familiarity with research concepts—their “research literacy.”¹⁸ Research literacy is “the cognitive and social understanding of the basic purpose, process, and value of research.”¹⁹ Research literacy interventions have been used to increase voluntary participation in research studies by patients and to teach research practices in the context of college and graduate school coursework.¹⁹⁻²¹ These interventions have demonstrated that even small increases in research literacy lead to significant increases in participation (as subject or researcher), as well as increases positive feelings toward research and researchers—a necessary underpinning for the adoption of EBP.

The hypothesis in this study was that, after watching an educational video about research, EDs would demonstrate increased research literacy, with a correspondingly increased desire to participate in, and belief in their ability to provide valuable contributions to, the research process.

OBJECTIVES

The objective of this study was to determine EDs' levels of research literacy, as well as their willingness and abil-

ity to participate in research, before and after watching a research education video.

METHODS

Design and Setting

This descriptive, prospective, and non-randomized cohort study was conducted from March 19-29, 2014, with EDs at an emergency communication center: Valley Emergency Communication Center (VECC), West Valley, Utah, USA. At the time of this study, VECC was not an International Academies of Emergency Dispatch (IAED)-Accredited Center of Excellence (ACE) in Medical, Fire, or Police emergency dispatching—but they are now ACE in Medical (as from October 2015). The ACE status is the highest distinction in 9-1-1 emergency communication services. ACE agencies demonstrate sustained high compliance to the dispatch discipline specific protocols and adhere to a set of international best-practice standards developed specifically for the emergency dispatch profession. Thus, although the center was not ACE accredited at the time, they had already begun the review process required for that certification, indicating they were already adhering to the field's accepted best practices (including, for example, the use of scripted protocols and the regular, standardized review of emergency calls).

The study consisted of a pre-intervention survey, an instructional video about research, and a post-intervention survey. The pre-intervention survey gauged EDs' current levels of research literacy and willingness/ability to participate in research. The video provided information about the purposes, processes, and (desired) outcomes of research, as well as information about the importance of EDs' participation in research. The post-intervention survey gauged changes in EDs' understanding of research as a result of watching the video, as well as any changes in attitude toward or willingness to participate in research.

Data Management

Pre-/post-intervention survey data was collected using pre-coded structured online questionnaires. No participant identifying information was collected on the questionnaires. All the data were automatically recorded in a secure survey system developed by the investigators. The study data were stored in secure servers at the Principal Investigator's site.

Sample Size Determination

This was a descriptive study; therefore, no power estimations were feasible. All willing emergency dispatchers at VECC were enrolled into the study. Participants who did not complete the pre-intervention survey, watch the entire video, and complete the post-intervention survey were excluded from the final study target sample—the sample used in the study group comparative analysis.

Measure		n (%)
		[N=68]
Work station	At Console	53 (77.9)
	Off Floor	15 (22.1)
Shift	Day	31 (45.6)
	Swing	10 (14.7)
	Night	27 (39.7)
Position*	Emergency Dispatcher	49 (72.1)
	Emergency Dispatcher Quality (ED-Q)	6 (8.8)
	Training Officer/ Manager	3 (4.4)
	Supervisor	10 (14.7)
	Trainee	3 (4.4)
Job Experience (years)	0-1	6 (8.8)
	1-3	10 (14.7)
	3-5	31 (45.6)
	5-10	7 (10.3)
	10+	14 (20.6)
Certification*	Emergency Medical Dispatcher (EMD)	68 (100.0)
	Emergency Fire Dispatcher (EFD)	68 (100.0)
	Emergency Police Dispatcher (EPD)	68 (100.0)
	Emergency Dispatcher Quality (ED-Q)	8 (11.8)
	Instructor	8 (11.8)
Read work-related research papers	Yes	41 (60.3)
	No	22 (32.4)
	Not Sure	5 (7.3)

*A study participant could hold one or more positions, and one of more certifications. Off Floor = on duty but not at a live dispatch/calltaker workstation (console). Swing between Day Shift and Night Shift (approx. 1500 – 2300 hrs).

Table 1. Study participants profile.

Data Analysis

Descriptive statistics, such as frequencies and percentages, were used to analyze the distributions of research literacy levels and other categorical measures. Otherwise, where data was significantly skewed, median and interquartile ranges were used. Differences between study groups' categorical study measures were assessed using Chi-square test. For normally distributed continuous measures, mean (plus standard deviation) and 95% confidence intervals were used to describe their distributions—and the Student t-test assessed inter-group mean differences. However, the Mann-Whitney U-test was used to assess group differences for skewed data. The significance of the differences was assessed at the 0.05 level.

RESULTS

There were a total of 85 EDs at VECC during the study period. Of the 85 EDs, 68 (80.0%) participated in the study. A significant proportion of study participants were line calltaker / dispatchers (EDs) (72.1%) and /or supervisors (14.7%), with 3-5 years of work experience (45.6%) (Table 1). The participants completed the study mostly while at their

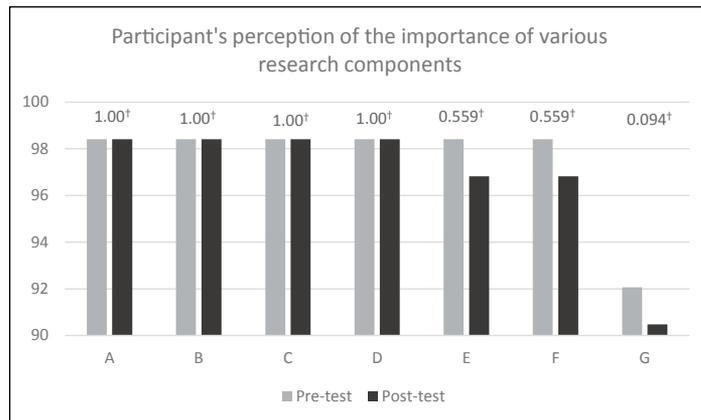


Figure 1. Study participants' perception of the importance of various research components.

work consoles (77.9%) during day or night shifts (45.6% and 39.7%, respectively). Every participant held certifications in medical, fire, and police dispatch, with about 12% holding instructor certifications as well. Finally, a majority (60.3%) of the participants were actively reading, or had read, published research related to emergency dispatch.

Of the 68 EDs who participated in the study, only 60 (88.2%) completed the pre-intervention survey, watched the entire video, and completed the post-intervention survey. These 60 participants formed the final study target sample for group comparative analysis.

Knowledge about research

Watching the video made several significant contributions to increasing the EDs' knowledge about research (Table 2). The video significantly increased the participants' ability to differentiate between qualitative and quantitative research (increased by 52%, p=0.044), correctly define the research process as systematic and methodical (increased 4-fold, p<0.001), and recognize that experiments compare different test conditions (increased 5-fold, p<0.001). However, although the video substantially increased the EDs' overall research literacy level from 49.0% to 55.3%, the difference was statistically not significant (p = 0.120).

Interest in participating in research

After watching the educational research video, more participants were willing to participate in research compared to before watching the video (67.7% and 79.4%). Although the increase in the level of interest was not statistically significant (odds ratio [95% confidence interval]: 1.84[0.86, 3.98]; p=0.120), the 11.7% increase was substantial and demonstrated one potential positive impact of the video.

Importance of various research components

Surprisingly, after watching the video, participants' perception of the importance of publishing research articles to share what was learned, and writing up research reports so that findings can be applied, slightly decreased—although

the difference was not statistically significant (Figure 1). On the other hand, although also not significant, a slightly lower number of participants, post-video, believed that sharing research findings through social media or video was not important ($p = 0.094$). Thus the findings about the importance of sharing research seemed to be contradictory.

DISCUSSION

The participants in this study were mostly EDs and supervisors, with the majority having more than 3 years of experience and all holding EMD, EFD, and EPD certifications. In addition to their experience, the majority of the participants had read or were reading research related to their field of work. This could be one of the factors contributing to the participants' relatively high existing interest in research participation (the majority of the participants already indicated a desire to participate in research prior to the intervention). Although it may have skewed the results of this study to some extent, this finding is potentially of interest, as it suggests that there may be a higher level of existing interest in research participation among EDs than was expected.

The intervention video had a positive impact on the participants' attitudes, knowledge, and perceptions about research. After watching the video, the participants' knowledge of research increased. For example, before watching

the video participants did not understand the exactness of research, in that it is always systematic and methodical. After watching the video, the participants were four times more likely to answer this question correctly than they were before. The level of interest in research participation also increased. Although this result was not statistically significant, it can still be argued that the video had a positive impact on the participants' interest level.

One surprising result was that the video appeared to have had a negative impact on the participants' perceptions of sharing research findings on social media or video. In the pre-intervention survey, a larger proportion of participants perceived that it is important to share findings via social media or video, compared to in the post-intervention survey (92.1% and 90.5%, respectively). Although the difference between these two proportions was not statistically significant, the result suggested further investigation into this finding in a future study. It is possible that this finding was an artifact of the video itself. The video focused so heavily on how research relates to dispatchers and informs daily practice that it may have inadvertently suggested that the key importance of research is its immediate use in the communication center in which the research was conducted. The importance of sharing results through publication may have been so downplayed that its importance was undermined in the minds of the participants. Future studies will attempt to parse out this finding.

Measure		Response (<i>True</i>)		
		n (%) (N=60)	OR(95%CI)*	p [†]
Qualitative research involves measuring outcomes with numbers.	Pre-video	34 (56.7)	0.48(0.23, 0.98)	0.044
	Post-video	23 (38.3)		
Research is always systematic and methodical.	Pre-video	23 (38.3)	4.07(1.90, 8.71)	<0.001
	Post-video	43 (71.7)		
Experiments compare different test conditions.	Pre-video	33 (51.6)	4.70(2.05, 10.71)	<0.001
	Post-video	50 (83.3)		
An interview is an example of quantitative research.	Pre-video	31 (51.7)	0.62(0.31, 1.28)	0.200
	Post-video	24 (40.0)		
“Variable” refers to the type of research being conducted.	Pre-video	26 (43.3)	1.00 (0.49, 2.05)	1.000
	Post-video	26 (43.3)		
Overall research literacy [‡]	Pre-video	147 (49.0)	1.29 (0.93, 1.78)	0.120
	Post-video	166 (55.3)		

*Odds ratio (95% confidence interval); [†]Chi-square p-value; [‡]Estimated from the cumulative responses—out of 60 participants in each research component.

Table 2. Study participants' knowledge about research.

Limitations

There were sample size and study setting limitations in this study. First, a relatively small sample size (60 participants) completed the pre-and post-intervention (video) survey. Second, the study only reflects the perspectives of one agency, which might have its own research culture. Finally, it was not possible to say if watching the video represents a long-term change in knowledge and interest, or simply a short-term effect. Therefore, the study findings should be interpreted and applied with caution. A future study using a larger sample size with a longer time-frame to gauge learning and attitudes is necessary to validate this study's findings.

CONCLUSION

The study findings demonstrated that emergency dispatchers certainly have an interest in participating in dispatch research and that they do read work-related research publications. An educational research video is one effective vehicle that appears to enhance emergency dispatchers' research knowledge-base and level of interest in research participation. Ongoing studies will both continue this work with a larger sample of EPDs and examine the effectiveness of other methods for increasing research literacy—and building a research culture—in emergency dispatching.

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